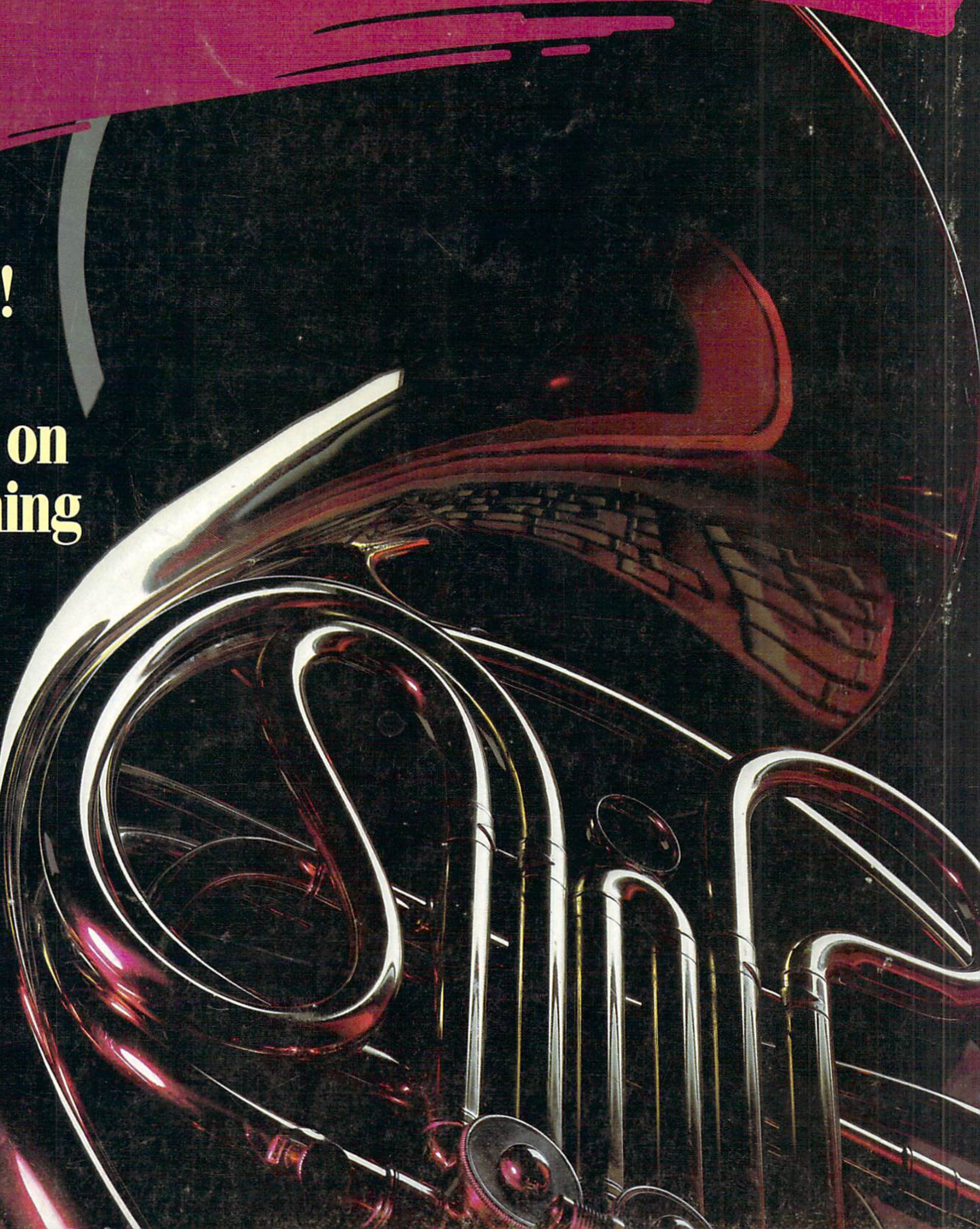
AMIGA WORLD

July/August 1987
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Software Symphony!

Rob Peck on Programming Sound

Mega Drives



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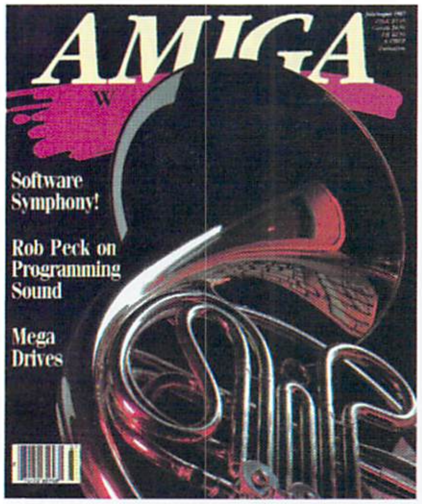
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COVER PHOTOGRAPHED BY PAUL AVIS

JULY/AUGUST 1987

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VOLUME 3, NUMBER 4

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1-800-441-4403

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Zeitgeist

By Guy Wright

I don't hear any music. Or not much anyway. I know it's out there somewhere, I can almost feel a bass line vibrating the floor, like someone's stereo in the apartment below. The sounds-and-songs side of the Amiga hasn't blasted anyone out of their chair yet, and at first listen, you would think that everyone was still waiting for something. A peripheral, an add on, a particular piece of software. There are occasional snippets of a tune done on an Amiga, and each show or demo has the obligatory keyboard and loudspeaker doing something. But where is the revolution? Where is the tidal wave of excitement that the Amiga with its super sound chip and stereo and sampling capabilities was supposed to create?

Background.

Mood.

Enhance.

Amiga music, speech and sound is there, it just doesn't come out and bite you. It is like multitasking. At first you think how great multitasking is going to be: running a word processor, downloading a file and having a spreadsheet going all at the same time . . . wonderful. But after using the Amiga for a few months, you find that the value of multitasking isn't really running more that one program at a time. It is the freedom of switching back and forth. Starting things, stopping things, pausing things, starting other things, rearranging directories, etc. It is the difference between sequential files and random access. The multitasking is invisible, yet you use it all the time. (Just try going back to another operating system sometime to see how much you use multitasking without thinking about it.)

The music side of the Amiga is a bit like its multitasking in an even subtler way. Like the editing or directing of a film, if it's good, you don't notice it at all. The soundtrack is the same. It adds to the film's mood and style, only occasionally taking a spotlight role. I thought, at first, that there wasn't any music for the Amiga. But then I started thinking about the software that is floating around here these days and I realized that I have been listening to the Amiga speak and sing and make unique sounds for quite a while without realizing it. I get annoyed at programs that simply feed words through the SAY function without "tweeking" them a bit first to smooth out the rough spots. I criticize the programmer's choice of phrases and words to be sampled and digitized. I absently snap fingers or turn down the sound depending on the title screen music.

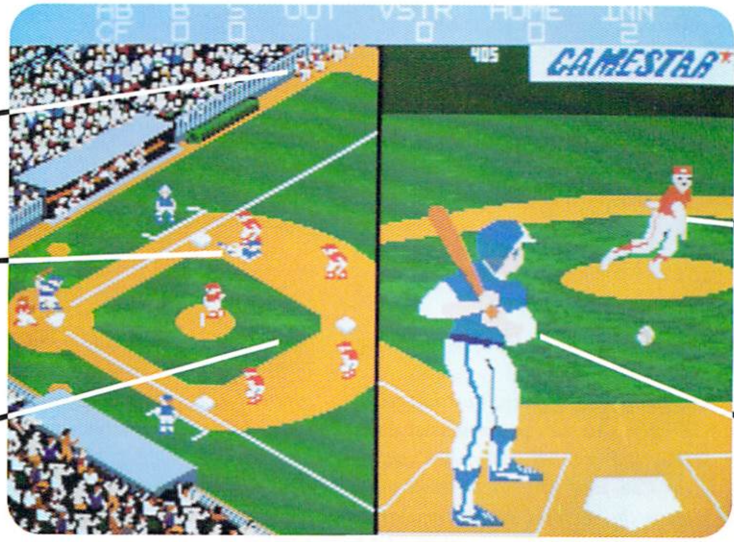
Now look at those last three sentences. "Programs that *simply* feed words through the SAY . . ."! How many computers do that? "Sampled and digitized words"!, the sound effects, the instruments, the music, the speech. All these are taken for granted because they are so



good. Try doing them on any computer of five years back.

When electronic synthesizers first appeared, their unique sounds were used more for shock value than for their musical capabilities. Like a funny sound nailed onto the side of a song. In the past few years, now that electronic synthesizers are more common, musicians have begun to integrate synthesized sound into the music, rather than onto it. That seems to be what happened with the Amiga and music. The people who are doing great things with the Amiga's sound capabilities are integrating their efforts smoothly into complete works. They are not waving flags and pointing at their creations. "Look, look, computer music! Listen to this! It's sampled sound!" Instead, it's the voice of the beer vender and the crowd noises and the squeak of sneakers in EA's One-on-One Basketball. It's the playing of the national anthems and the nauseating slap when the cliff diver misses in Epyx's World Games. The chanting and other music in The Bard's Tale. The theme music from The Pawn, Mindwalker, Marauder II, etc. There are and will be more and more Amiga music creations that stand alone, but I think that the majority of the Amiga music and sounds are going to be integrated into other pieces of software. They stand out by their absence on other computers. And, perhaps taking them for granted is the highest compliment. ■

You Told Us What The Best Computer Baseball Game Would Have



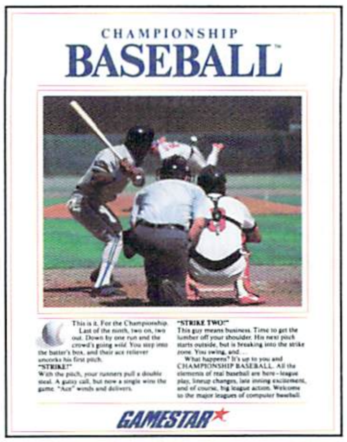
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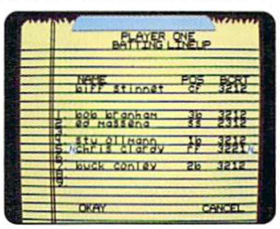
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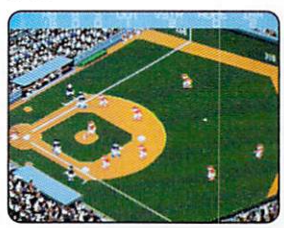
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Repartee

Zingers

This letter is in response to the review of our product Zing! by Sheldon Leemon, published in your May/June '87 issue. This review seriously misrepresented our product and our company. Mr. Leemon made many statements that were totally inaccurate and were slanted to give a negative impression. Four other very positive reviews of Zing! have been published in other magazines. We invite your readers to read other reviews of Zing!, or ask other Zing! owners about their impressions. We are sure your readers will discover that Zing! is considered a very useful and unique product. It is our belief that Mr. Leemon did not spend a reasonable amount of time examining our product before writing his review. We believe that he did not even realize that Zing! provides a complete interface to the operating system, and is not just a tool for file manipulation.

Mr. Leemon's review implies that Zing! does not provide the convenience of memory resident capability. The back cover of the Zing! package lists 20 items that are all memory resident. With the multitasking Amiga, you have complete control over whether you want Zing! (or any other program) to be memory resident or not. Zing! was designed to take advantage of the multitasking environment.

Mr. Leemon listed some statistics for Zing! versus CLI that were totally invalid because they compared two operations that were not the same. Zing! can perform the same CLI operation he listed in the same amount of time and vice-versa. Mr. Leemon fails to point out that with Zing! a user can perform most operations many times faster than with the CLI, and without the need to learn the complex system commands and syntaxes required with the CLI.

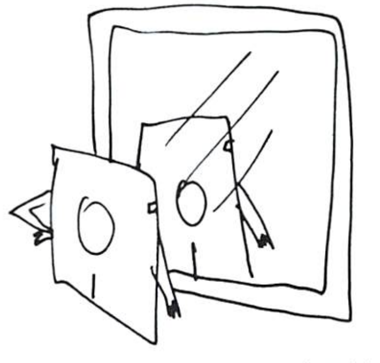
Mr. Leemon's description of the Zing! File Information Window was very incomplete. He pointed out that the window displayed a great deal of information about a given file. However, he failed to point out that the user can very easily point at the critical data (such as the file name, protection status or file comment) and immediately change the data. This unique approach is much more convenient and easy to use than the required CLI commands. In addition, Mr. Leemon neglected to point out that the File Information Window allows you to load the displayed file into your favorite editor with the click of a single button.

Mr. Leemon stated that "The file program does absolutely nothing to aid single-drive owners, who are most in need of help with file manipulation." This statement is absolutely untrue! As stated above, Zing! makes most of the file manipulation routines memory resident, so that the Workbench disk is not needed for most operations.

Mr. Leemon stated that "The manual is long on hyperbole and short on explanation." The passage he quoted was taken from a seven and a half page explanation of one menu out of the 15 programs for Zing!. Hardly a short explanation! The section was describing a feature that Mr. Leemon fails to point out in his entire review. This Zing! feature allows you to manipulate files from multiple directories in a single operation. To the best of our knowledge, no other computer software system provides the ability to copy a portion of a tree of files and directories with a single operation.

The vast majority of Mr. Leemon's points are inaccurate or incomplete. This letter describes a few of the more damaging examples. However, the points that he neglected to mention are even more ridiculous. For example, he did not point out that Zing! conveniently displays the available devices that can be pointed at with the mouse for use with many functions. But most importantly, Mr. Leemon never stated that he tested our product with popular Amiga configurations, such as two or more disk drives, external memory or hard disks. Zing! is not copy protected, and supports the use of these popular devices fully. The power and ease of use Zing! provides becomes more and more apparent as you work with larger numbers of running tasks and files.

Meridian Software is very devoted to the Amiga and its customers. Since releasing Zing! in October of 1986, Meridian Software has provided updates, published a new manual, enhanced the packaging, produced a patch program to add more flexibiltiy to Zing!, sent a newsletter out describing useful hints and tips, made available a special hard disk version of the product, produced a new product (Zing!Keys) that makes Zing! (and any other product) much easier to use and has provided faithful and continual support to its customers. We appreciate the chance to make our position known, and invite AmigaWorld *to publish fair and honest reviews of our products.*



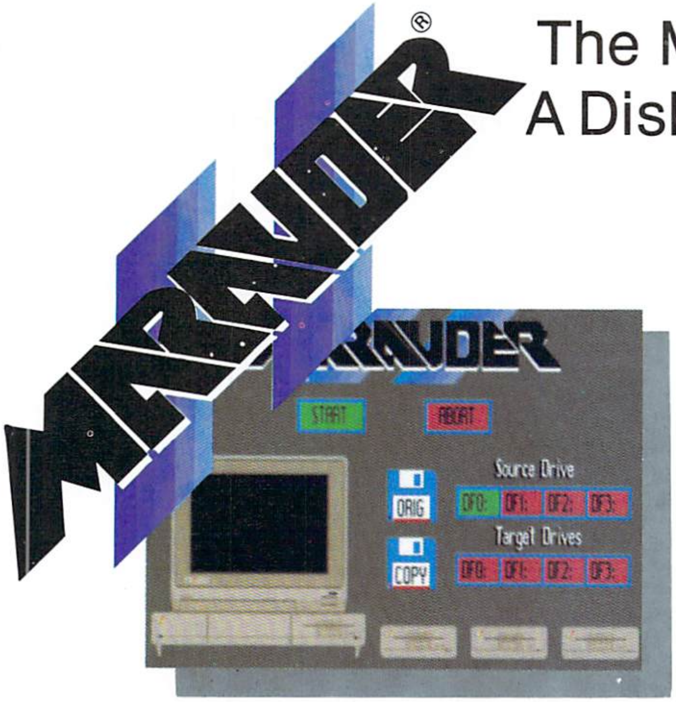
Jerry Farmer, President
Frank Taylor, Vice-President
Meridian Software Inc.

While our reviewers' opinions do not necessarily represent those of the *AmigaWorld* staff, we encourage our reviewers to go beyond a dry command-by-command description of a product. Considering the number of programs we cover each issue, it is impossible to describe every detail of every product in the space alotted. The unfortunate side of this is that a feature which seems trivial to a reviewer might seem vital to a reader. We feel a slightly subjective view is helpful to our readers, for it provides a user's perspective of the program's performance that a simple listing of features can't. As with ►

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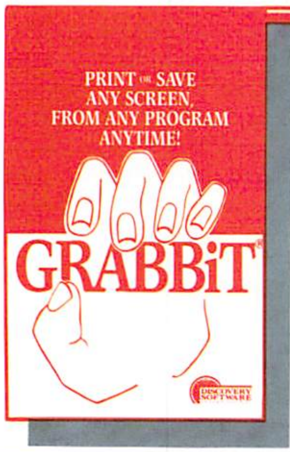
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movie critics, you quickly learn who you agree and disagree with, then judge their reviews on that basis. According to Meridian Software, our review of Zing! contained technical inaccuracies, errors of omission, and missed the point of the product. What do you think? We're very interested in hearing from those of you who use Zing!.

—**Editors**

More Controversy

It was a great disappointment to read Peggy Herrington's review of Money Mentor [March/April '87, p. 88]. We realize that any legitimate magazine must publish what it feels is the truth. I have no doubt that Mrs. Herrington reported the facts as she understood them. Yet her review contains a few factual errors. The new version of Money Mentor will be in C, not Modula II. (In November, when we spoke to Mrs. Herrington, we were considering Modula II.) She claims that Money Mentor erased information from her disk. The fact is that Amiga Basic keeps a lot of data in the core of the machine. When she controlled out of the program, she lost the data in the machine, not the data on the disk.

We have a bigger problem with the tone of the review; it implies that Money Mentor is not careful with the user's data. We have over 1,000 users of our products and not one of them has reported data lost due to program failure. Money Mentor has an elaborate Verify Database command to reconstruct the database if there is a catastrophic failure. Money Mentor also has software traps to save data if there is a software error. The only way to lose data is to do what Mrs. Herrington did—reboot the system.

Money Mentor also has many unique charts and screen reports that the competition is lacking. One third of the Money Mentor system is devoted to graphics—a fact that was not discussed in the review.

We realize that Money Mentor is not a perfect product. The fact that it was written in Amiga Basic and lacks a Net Worth calculation are serious flaws. Money Mentor is, however, under constant development. Version 2 of the program will be coded in C and have more financial calculations. Version 3 will be a complete financial management system; it's due out by the end of 1987. We would greatly appreciate a second chance for a review when the new versions are available.

Ken Colby
Sedona Software

1000 vs. 2000

I'm offended by what Bob Ryan wrote in "Back in Front . . . Amiga Again" [March/April '87, p. 17] concerning "what the A1000 should have been." Sure, Commodore's efforts are to be commended on the new 2000, but don't you think it's a little premature to discredit the A1000? When considering the A2000, it's simply a question of whether or not you want to fool with IBM compatibility. It isn't beyond the realm of possibility that very soon, with the advent of Texas Instruments' new four-megabyte chip, A1000 owners will be able to accomplish and exceed (with a front polymorphous plug-in pack, where the 512K expander now goes) what the A2000 does. There are a great many things, yet to be discovered, that the Amiga 1000 will be able to accomplish. I love my Amiga 1000 and must defend its superior virtues.

Stephen E. Franklin
Bossier City, LA

I like slots, so I think the A2000 is superior to the A1000. I don't feel that saying so discredits the A1000; it is still a great machine. Trying to expand internal memory as you suggest can lead to configuration problems (where do you put the memory on the memory map?) and bus contention with chip RAM. *AmigaWorld* will continue to stress the excellence of *all* Amigas.

Bob Ryan
Technical Editor

Unintentional Omission

In the roundup of Amiga 1000 memory boards (info.phile, May/June '87, p. 40), the C Ltd. aMEGA Board was conspicuously absent. This was due to problems encountered in shipping one of the boards to our reviewers and doesn't reflect negatively on the aMEGA Board. For more information about the aMEGA Board, contact C Ltd., 723 E. Skinner, Wichita, KS 67211. 316/267-6321.

—**Editors**

Correction: The number we published for Kent Engineering & Design in our review of MacroModem (May/June '87, p. 72) was incorrect. Please direct your calls to: 315/685-8237.

Send your letters to: Repartee, *AmigaWorld* editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■


THINK OF IT AS
YOUR AMIGA'S AMIGO.
AMIGA
XEBEC
9720H

Hors d'oeuvres

Got an idea simmering on the back burner? Turn up the heat and send it in. If it gets published, you'll receive, free of charge, an AmigaWorld T-shirt. (Sorry, we ran out of ginsu knives.)

Format and Install

I have a quick mini-program that makes data disks for me. Using ED, create the following file:

```
echo "Formatting Drive DF1:"
format drive df1: name "Empty"
echo "Installing DF1:"
wait 4 secs
install df1:
echo "Installed copy finished"
```

Save this file with a name like FORMA1 and when you need it just execute forma1. (Make sure you have the empty disk in DF1: rather than something you want to save!) This saves a little time.

Bill Ott
St. Petersburg, FL

Kids Disks

While creating a disk of programs for my four-year-old to use, I was faced with the problem of how to keep him from opening icons that he shouldn't, such as Amiga Basic and BMAP files. What I finally came upon was to delete the .info file for the file or program that I didn't want available. With a disk named TOY BOX, an example would be: DELETE TOY BOX:AmigaBasic.info. Although the icon for Amiga Basic is not visible in the window, the program is available for loading when another program is selected to run.

Gary Elder
Kennewick, WA

Stop Clicking

I just bought my Amiga with an external drive a few days ago. I really love this machine, but one thing did annoy me. If there wasn't a disk in one of the drives it would make this clicking noise every few seconds. After a few days, it occured to me that all the drive wanted was a disk—any disk. So, from now on, if I'm not using a particular drive, I insert a spare disk and the clicking stops.

Sandra Keller
Haddonfield, NJ

Editor's Note: I know there are thousands of you out there who just finished reading this and said "This is one of the dumbest tips ever printed!" But remember, you had to figure this one out for yourself at one time. Some of the best tips are the ones that many of us take for granted.

Basic CLEAR

If you use CLEAR to allocate working space for your Amiga Basic program (e.g., CLEAR ,150000), then try to run your program twice in a row. You may get an OUT OF MEMORY message, even if you didn't change the program between runs. If you had memory to run it the first time, then why not the second?

The cause: Amiga Basic retains the first 150,000-byte area while trying to execute the second CLEAR ,150000 (it keeps the text of your program in the first area until it can move it to the second area). You end up needing 300,000 bytes to run the second time.

A solution: Replace the CLEAR ,150000 with:

```
CLEAR ,X
CLEAR ,150000
```

where X is just large enough to hold the text of your program. That way Amiga Basic only needs 150,000 + X bytes to run the second time.

A word of caution: Be certain that X is large enough or you could get hung with an OUT OF MEMORY message that requires re-booting the system. You can find out how large to make X by loading your program, executing it in the immediate mode then entering:

```
CLEAR ,Y
PRINT Y-FRE(0)
```

where Y is known to be larger than the size of your program. The size of your program will be printed (but add a reasonable amount to allow for future revisions).

Ron Charlton
Knoxville, TN

Converting to 1.2

I thought some people might want to know the exact steps to transform a version 1.1 disk so that it will use the faster file access of version 1.2. Step by step:

1. Boot the system using 1.2 Kickstart and Workbench.
2. Put a blank disk in your external drive and initialize it.
3. From the CLI, type COPY C TO RAM:.
4. When it is finished, type CD RAM:.
5. Remove 1.2 Workbench disk and put the disk you want transformed into DF0:.
6. Type COPY ALL FROM DF0: TO DF1:.
7. When it is finished, type INSTALL DF1:.

You now have a bootable 1.2 disk ready to go.

Brian Whitworth
Los Angeles, CA

Deleting Directories

In the November/December '86 issue, Vincent Lee offered a method of getting rid of an unwanted RAM:C to free up memory. I would like to offer a shorter method of getting rid of any undesirable directory. Type the following from the CLI while out- ►

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side the directory to be deleted:

DELETE pathname ALL

where pathname is the full pathname of the directory that you want to delete. This command will delete all files and subdirectories under the directory named and then delete the directory itself.

For example, suppose you wish to eliminate RAM:C. After removing yourself from RAM:C (using CD), type DELETE RAM:C ALL. All files in RAM:C will be erased, and then the directory will be removed. This will work with disk files as well. If you type: DELETE DF0:C ALL with a Workbench disk in the internal drive, the C directory will be erased. While this is really useful for editing disks, it is very fast and not reversible, so be careful and make sure that you want to do it before pressing that Return key!

Homer Luman
Odessa, TX

RAM Disk Speed-up

I use a RAM disk all the time and I found a way to speed up the time it takes to create one. My usual execute file that created a RAM disk and stored my personal list of commands used to take about 49 seconds to load, but when I rearranged it so that the ASSIGN C: RAM:C command came at the beginning of the file, I cut the time down to 30 seconds. For example:

```
makedir ram:c
copy sys:c/copy to ram:c
assign c: ram:c
copy sys:c/cd to ram:c
.
.
.
```

Using this method means that the more commands you add to the RAM disk the more of a speed increase you will notice. Another note, the reason for the "SYS:C?" prefixes is so that this command will work no matter what the current directory is.

Mike Mayberry
San Jose, CA

Emulator Speedup

Like many others, I too have struggled with improving the speed of the Emulator/Transformer. I found an answer in my copy of the IBM DOS Reference manual (version 3.10) on pages 4-3 to 4-25 (IBM Publishing, February '85). Several "industrial strength" programs require changing the number of Buffers and Files, but changing the Device to use the "ANSI.SYS" is suggested only if the keyboard is non-standard, which is the case with the Amiga.

Here is the exact set of commands:

```
COPY CON CONFIG.SYS
BUFFERS = 20
DEVICE = ANSI.SYS
FILES = 20
{F6} or {CTRL-Z}
```

As the Reference manual says, after the first line of the above command, there is no standard prompt; it reappears after the last line and a report on the number of files copied. This change in my boot-up DOS speeded things up remarkably.

Thank you and your readers for the suggestion about "SPEED3.COM." I now have it in an "AUTOEXE.BAT" file on my DOS disk, in addition to the "CONFIG.SYS," resulting in a greater speed and responsiveness when in the emulation mode. Clocks displayed on the screen in some of the programs now lose only about five minutes per hour (my way of judging operating speed).

Charles Gibson
Lomita, CA

Extra Help Screens

Like James Nakakihara (January/February '87), I use ED a lot, relying on the basic commands that I can remember from the AmigaDOS manual. I am usually in too much of a hurry to look to see if there is a command to do something directly. And I didn't want to make up a table for my desk, since there already are too many things piled up around here vying for space with the mouse. After reading J.K.'s suggestion, I typed up a help screen, organized by function, CURSOR, DELETE, BLOCKS, etc. Everything I needed fit on one screen, but I knew that I would need at least two screens for a functional list of commands in Scribble! Fortunately, there are easy ways to get as many help screens as you want.

For working with ED, make up text files and save them on your Workbench disk as EdHelp1, EdHelp2, etc. At the 1> prompt type NEWCLI. You will get a small window with a 2> prompt. Open it up to full size and type TYPE EDHELP1 to display your help screen. You can now use the depth gadget to put it behind the 1> window where you can then ED WORKFILE to go to work. If you need more than one help screen, just type NEWCLI again from the 1> prompt to get another window, open it up and at the 3> prompt, type TYPE EDHELP2. Now you can have as many help screens as you like all running behind each other in different windows.

If you want to have a convenient help screen for a word processor like Scribble!, just type up your custom screen and save it as Help.doc on your Scribble! disk. When you go to work, open an extra window and load Help.doc in that window. Since the word processor makes it easy to scroll through a text, your Help.doc can be several screens long and you will still be able to get to it all easily. Now when you need to refer to the help screen, just press F5 to flip between the window where you are working and the Help.doc on the other window.

Robert Jenkins, Ph.D.
Chicago Heights, IL

Inexpensive Video Camera

For those who want a cheaper video camera for use with Digi-View, I suggest a Magnavox Home Security camera. It is sold through DAK Industries, 8200 Remmet Ave., Canoga Park, CA 91304, 800/325-0800. Each camera, with microphone, 57-foot cable and mounting stand is only $169 compared to Panasonic's $280 model. This may be helpful to those wanting to utilize the powerful Digi-View system.

John Forman
Omaha, NE

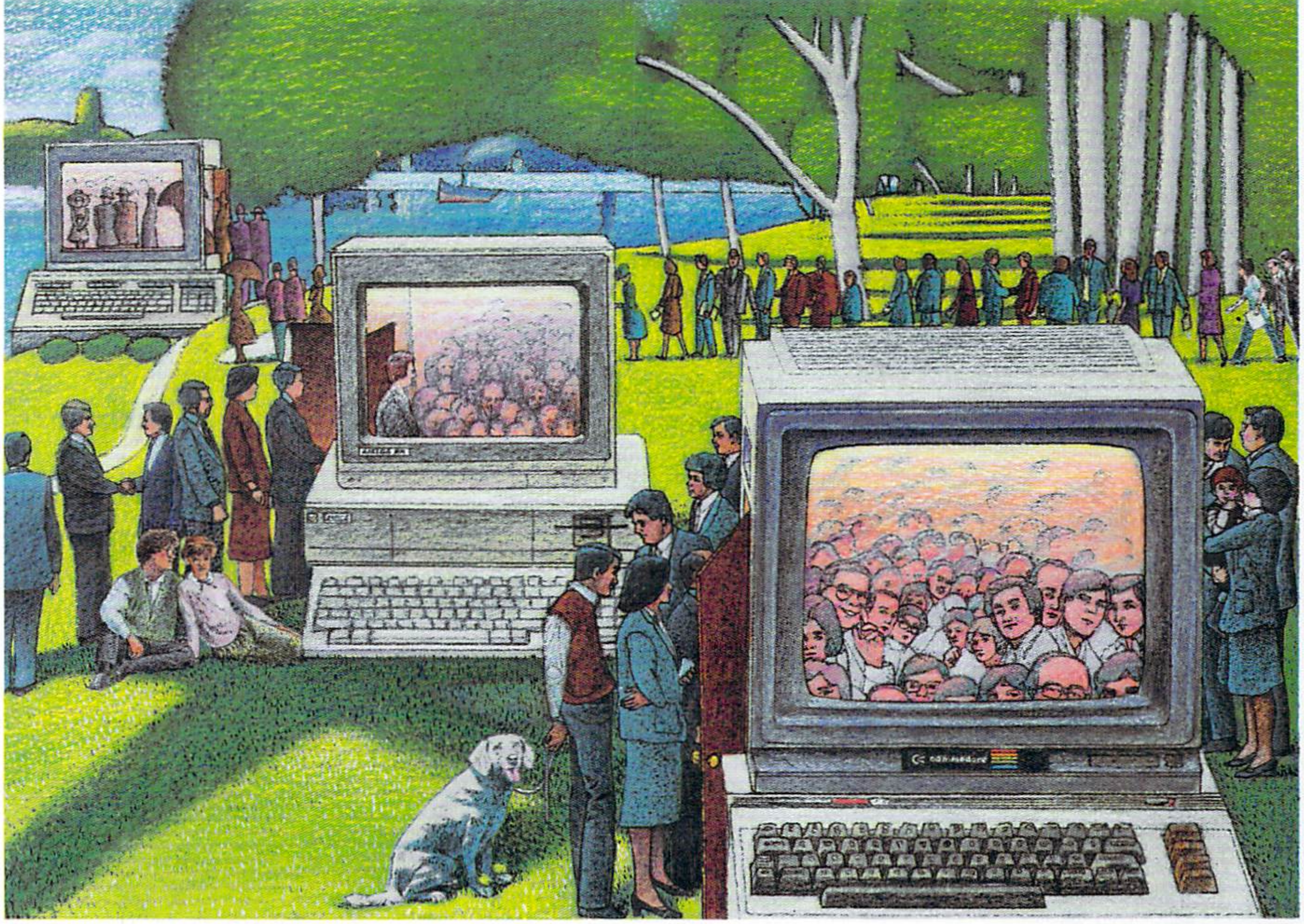
Window Title Spaces

Without any manual on hand except the *Introduction to Amiga*, it took me a long time to figure out how to put a space in the title of a window. If you try to open a window with a name like "New CLI," you will probably get an "Invalid Argument" error because the DOS sees the space as a delimeter. A simple way around this problem is to use the ALT key/space (or Ctrl-N if you are in the alternate character set). So all you have to do is press and hold the ALT key while pressing the space bar, and the Amiga will accept it.

Kenneth Pak-kin Wong
Los Angeles, CA

Execute in S

If you use AmigaDOS Execute files a lot, you may be surprised to learn that an Execute file, placed in the S directory on the Workbench, will be accessible, no matter what the current directory may be. You can move a file to the "Sequence" directory with COPY file TO S:. ►



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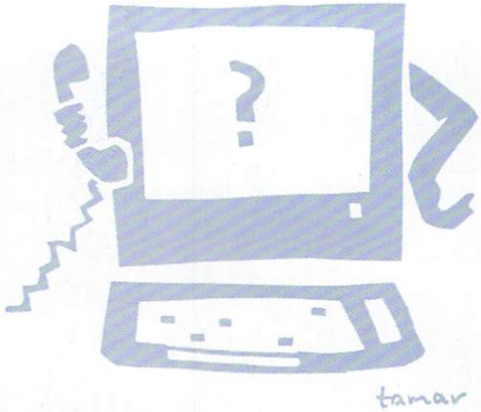
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You may also find it helpful to make a second copy of the Execute command with a shorter name. For example: COPY C:Execute to C:X ought to do the trick.

Bryce Nesbitt
Berkeley, CA



Top of Form From CLI

After printing a file to your printer, you may find that the paper is not aligned to the top of the next page. To send a top-of-form code to your printer from the CLI, type:

COPY * TO PRT:

then press Ctrl-L, then Ctrl-\, then Return.

Bryce Nesbitt Again
Berzerkeley, CA

Shortened Commands

Here is a shortcut that I found useful when using CLI. I went to the C directory and copied a number of commands, giving them shortened names. For example:

COPY C:DIR TO C:D
COPY C:ENDCLI TO C:END
COPY C:DELETE TO C:DEL

Now if I'm getting rid of a few old files, I just type DEL instead of DELETE. It saves a lot of time, but there is a price. Each command that you COPY takes up about one block of space. You can RENAME commands, but programs may need them under their old names, so be careful.

Rigoberto Ramirez
Buckhannon, WV

Basic Baud

When writing my bulletin board program in Amiga Basic, I was looking for a way to set the baud rate. The following POKEs accomplish this:

POKE 14676018, 12000 = 300 baud
POKE 14676018, 3000 = 1200 baud
POKE 14676018, 1500 = 2400 baud

There are many other values you can use, but these are the most common.

Gary Chernega
Endicott, NY

5¼″ Drive Steals 30K

Being an energy-conscious Amiga Transformer owner, I would only turn on my 5¼″ drive if I was planning to do some IBM emulating. I found out, however, that by leaving the drive off, it was robbing the system of approximately 30K. While this isn't a major concern for most applications, it did affect the performance of several high-RAM programs, such as DeluxeVideo and Aegis Draw. Now at the beginning of my computing sessions I turn on the 5¼″ drive no matter what I am planning to do, just to be on the safe side.

Al Willen
Riverdale, NY

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Reaching the Notes: Easy Access to Amiga Audio

Simple and straightforward C routines for getting at the power of the Amiga's audio device.

By Rob Peck

I remember being asked in May of 1986, while working at Amiga in Los Gatos, "Why didn't they make the audio easier to use?" I didn't have much time to think about it then; I was too busy documenting other things. It made sense to leave the audio to the experts. It wasn't until I left Amiga and started writing *Programmer's Guide to the Amiga* for Sybex (specifically the chapter on audio) that I discovered the lack of information on using the Amiga audio device. The question was brought home to me: If the Amiga's audio is really so great, why aren't many people using it?

I decided to write some audio routines that would be simple to use. Reference books such as the *ROM Kernel Manual* describe many audio features, but demonstrate only a few of them. Worse still, the demo programs use the hardware *directly*, and I didn't want to do that! What I wanted was to be able to queue up several sounds and have the audio system play them sequentially while my task went on doing what it was doing. Going directly to the hardware meant the audio device would neither count cycles for me nor queue sounds for automatic play. In effect, I wanted audio routines that would be as simple to use as this:

```
    main()
    {
/* ...program-stuff... */
InitAudio();/* initialize everything */
channel = GetChannel(-1);
if(channel != -1)
{
PlayNote(channel, waveform, note_no,
                  volume, duration);
/* ... (more PlayNotes) ... */
}
/* ...more non-audio stuff... */
FreeChannel(channel);
FinishAudio();/* close everything down */
    }
```

Sound queueing can be done using the audio-device command called CMD_WRITE, but I found no examples that used CMD_WRITE until I stumbled across one on Usenet (reposted from BIX). By putting together pieces of that program and things I developed subsequent to finishing the audio chapter of my book, I came up with the library of routines presented here: a Playnote routine in C, with support routines to talk to the hardware. The details of device access and message passing are buried in subroutines where you don't have to deal with them. By examining the source code I've provided, you'll learn how to communicate with the audio device and to add enhancements to these routines.

The Public Functions

Here is an explanation of the major routines in my ►

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audio device library. If not otherwise stated, all parameters passed to the routines and passed back as return values are *long* integers (32 bits). Sometimes a pointer (also 32 bits) is used, and is shown as such.

gotchannel = GetChannel(channel);

channel—any number from 0 to 3, corresponding to a specific hardware channel on the Amiga. If you ask for channel number −1, it means get *any* channel that is available. The function GetChannel returns the channel number, or returns −1 if none are available to you.

PlayNote(channel,waveform,note_no,volume,duration, priority,message);

channel—a channel that you already own. If you don't own it, the note will not play.

waveform—a pointer to the start of a waveform table that contains 256 samples of a single wave of your sound. Sample values range from −128 to +127. The waveform table also includes copies of the same waveform, each having fewer and fewer samples in the table (128 samples, 64, 32 and so on). This waveform table lets us stay within the allowable limits of the Amiga audio hardware. In particular, period values of 127 through 500 are the values that let the Amiga output the best quality audio. To get an output that is of a high frequency—because the period values are limited—each wave of the waveform must be output more quickly. Thus the table with several copies of the waveform, each having different numbers of samples. See the source code for MakeWaves to see how the tables are built.

For most of us, who just need to *beep* at somebody, these routines make access to the audio device simple.

Note Number—Notes are numbered from 0 to 95, structured as eight octaves of 12 notes each. Each octave has its own waveform table entry having a length appropriate to that octave.

Volume—Takes a value from 0 to 64 where 0 is minimum.

Duration—specified in 1,000ths of a second. The audio device accepts a command to output a specific number of cycles of a waveform. I calculate the frequency (in cycles per second) from the note number, then multiply by duration and divide by 1,000, yielding the correct number of cycles for that frequency. Thus all notes play for the correct time.

Priority [*not implemented yet*]—If priority is 0, just queue the note. If less than 0, flush all current requests for this channel and start this note only. If greater than 0, do not flush . . . the priority value is only going to be used to identify the note number to you when the note begins to play.

Message [*not implemented yet*]—Audiotools can send you a message that contains an identifier of your choice (the priority value) to let your task know that this note has just begun to play. On receiving the message, your task must reply to it so that the audiotools can reuse or deallocate the message memory.

FreeChannel(channel)

Frees a channel that you own to let another task (or your own task, later) use the channel.

InitAudio() and FinishAudio()

These functions take care of the background work, such as opening and closing the audio device.

PlayNote is asynchronous: It queues up a note to be played by the audio device and then returns to the calling program immediately. (It does not wait for the note to be finished before it returns to the caller.) All other functions in this library are synchronous; they're completed before your program goes on to do something else.

By using these routines, you do not have to deal with the audio device; you need not allocate and initialize message blocks and so on. All of that is built into the support routines and associated global variables. If you're designing a high-performance audio routine, you just may have to lock the channels and go directly to the hardware. In such instances, use the ROM Kernel examples as your guide.

But for most of us, who just need to *beep* at somebody, these routines make access to the audio device simple. They also provide a jumping off point for further audio development.

Support Functions

The audio library contains the following support functions:

error = StopChannel(channel)
error = StartChannel(channel)

Stop or start a specific channel. If a CMD_WRITE arrives at a stopped channel, it queues and waits for the channel to be started. A return value of 0 means no error. A return of −1 indicates low memory. Any other value is a direct return from io_Error. See devices/audio.h for meanings of other return values. StopChannel terminates any CMD_WRITE currently in progress.

error = FlushChannel(channel)

If there are CMD_WRITEs lined up to be played, return them all to the caller (flush input).

error = ResetChannel(channel)

Reset it to its default values; also, flush a channel's input queue.

error = SetPV(channel, period, volume)

Set the period and volume of a note that is playing currently. Note that there is only a limited range available for the period (roughly 127 to 500), so it is more likely that you would use PlayNote instead, because PlayNote can modify the waveform pointer as well as the other parameters.

Internal Functions

These internal functions are used by the library functions described earlier. Your programs may, at times, need to access these functions directly. These functions create, initialize and free audio device message blocks. I call them IOBs, for I/O Blocks.

such as *PlayWave(channel,sample_addr,copy,period, repeats,priority,message)*. Global variables would be expanded to include a separate ReplyPort for the sampled sounds. A copy (TRUE/FALSE) parameter would specify (if TRUE) that the sampled wave should be copied into chip memory before queueing it to be played. If FALSE, it would assume that sample_addr is in chip memory and that you will not change the contents of memory before the note has completed playing.

- Add a PlayFreq function that takes a frequency value instead of a note number so that oriental music, for example, not based on the same scale we use for a piano, could be played. PlayFreq would take exactly the same parameters as PlayNote, but substitute "frequency" for "noteno". It would calculate which is the longest waveform that can be used for the selected frequency and still leave the period value within the appropriate range of 127 to 500.
- Add an implied rest between notes to create a more natural sound and avoid having to explicitly encode such rests into a song structure.
- Add the ability to specify a slew rate for either volume or frequency or both so that notes instead of going directly from one setting to another can slide to the new setting at a specified rate.
- Or perhaps better still, add full ADSR capabilities. (This one is a little tricky. It could require software interrupts or perhaps even breaking into the audio-interrupt vector itself. It would also require a data structure larger than the basic IOAudio structure to hold these new variables.)

Conclusion

Basically, this article is a progress report on a continuing project to develop a set of freely-distributable, license-free routines that make it easier to use Amiga audio. I welcome suggestions about additional enhancements. (See the information below on acquiring a disk with the source and object code.) I hope this article and the accompanying code will help any of you who are interested in easily taking advantage of the Amiga's audio power.☐

Rob Peck is the author of the Programmers' Guide to the Amiga, *published by Sybex. He was Manager of Technical Documentation for Amiga where he put together the* Amiga ROM Kernel Manual *and the* Amiga Hardware Manual. *Write to him at the address printed below.*

Due to space limitations, it was not possible to describe in detail each routine in the library. Rob has agreed to make available a disk containing the source and object code for the routines published here as well as updates completed before publication. The disk is available for $8 postpaid for U.S. orders; foreign orders add $2; California residents add sales tax. Send your order to DATAPATH, PO Box 1828, Los Gatos, CA 95031-1828.

Listings follow on p. 90

iob = GetIOB()

Allocate or assign an IOAudio structure for use. Returns a value of 0 if system is too low on memory. If no IOB is available from a specified pool of IOBs, then dynamically allocate an IOB and pass back its address. Note: for more advanced system functions this structure may need to be extended to hold additional parameters. For now, though, the ExtIOB structure is identical to the normal IOAudio structure (created for now by a define statement). This allows us to define an extended version of the structure later, with little if any change to existing functions.

ReEmployIOB()

Look at audio channel reply ports and see if any IOB's have returned (are now unemployed) and can therefore be reassigned or deallocated.

FreeIOB()

Return a finished IOB to the free IOB pool or deallocate a dynamically allocated one.

InitBlock(iob,channel)

Initialize an IOB for communication with a specific channel, default command is CMDWRITE. iob is a pointer to an IOAudio structure. Channel is the specific channel for which this block is to be initialized (allocation key is the critical item).

ExpandWave(waveformpointer)

Takes a pointer to a waveform buffer that contains one cycle of a waveform, in 256 consecutive bytes, and expands the table to add the same waveform sampled 128 times at twice the sampling interval, 64 times at 4 times the sampling interval, 32 times, 16 times, 8 times and so on. The wave tables *must* be in chip memory; otherwise the audio device will be unable to play the notes! ExpandWave is associated with MakeWaves(), which creates three tables total, one containing a sawtooth wave, one a triangle wave and the third contains a square wave. ExpandWave completes the table entries for each waveform. All of the waveforms are left in contiguous memory after the first wave, in order of decending sizes (256, 128, 64, . . .).

MakeWaves, ExpandWave, SetPV and PlayNote are paraphrased versions of similar routines found in a posting to BIX by Steven A. Bennett. (Thanks, Steven, for the inspiration on this project.) Steven's posted article also provided the waveform and period tables I've used, as well as the excellent explanation of the period value calculation that I've quoted (slightly modified) below.

As you examine the source code provided, you'll see that the audio device requires a period value rather than a frequency value. The period table contains the period value corresponding to the frequencies of the normal scale (12 notes per octave. See ABasiC manual, page 138). You could calculate period yourself from the formula: *period = Clock / (samples-per-wave * frequency).*

Clock rate is 3,579,545 cycles per second. So if you are playing a wave table that contains 32 samples, and your selected output frequency is to be middle-A (440 hz) of the piano, the period value is 3579545 / (32 * 440) = 254.229, with the results rounded down for use by the audio device.

More on Internal Functions

For GetIOB, you can control how many structures are allocated for IOAudio use. How many audio ioblocks should the system have available for queueing up notes? If you want to queue up a whole song by using a whole bunch of PlayNote commands and go away to do something else, it could take a lot of memory! Once the system runs out of these preallocated structures, it must dynamically allocate and free memory. This can cause fragmentation of memory space. You might want to send parts of the song at a time instead of the whole song.

Depending on the variable AUDBUFFERS (defined when the program is compiled), GetIOB either returns the address of a buffer in global memory space, named "global" (in the name field of the I/O message, node area) or named "dynamic" if GetIOB runs out of AUDBUFFERS global blocks to use. The number of dynamic blocks is limited only by the available system memory (fast memory—that is, non-chip memory—is used for the I/O blocks).

To be able to use only a standard-sized IOAudio structure for the message passing, I assigned the message mnLength field to identify the global blocks. (As of 1.1 and 1.2, the mnLength field is still available for anybody to decide what meaning it has.) To be perfectly safe, as well as to handle the advanced functions that people have requested, an extended audio block should probably be used, with a *long* quantity appended to it as the identifier in place of using mnLength, as well as a few other fields. This change is very likely to be made for the disk version of the tools. (The structure ExtIOB will be used as an extended version of IOAudio.)

The wave tables *must* be in chip memory; otherwise the audio device will be unable to play the notes!

The Sample Program And Suggested Enhancements

Using the above functions, audiotools.c (Listing 1) plays a few notes through each channel in each of three waveforms: sawtooth, triangle and square waves. All four channels are active at the same time. When all notes have completed, the program exits. The program was compiled under Amiga (Lattice) C and runs under version 1.1 or later. The program runs from the CLI.

While working on this article, I gave a talk at a developer's group meeting. The following enhancements were suggested at the meeting:

- Add examples that use a stereo pair.
- Check that all error conditions are properly reported ("bullet-proofing"—this just has to be done).
- Implement the Priority and Message fields of PlayNote as described.
- Add a PlaySong function that can take a pointer to a data structure that describes a song, with some of the parameters that PlayNote takes, and play the song automatically.
- Add a PlayWave function to handle sampled sounds, ►

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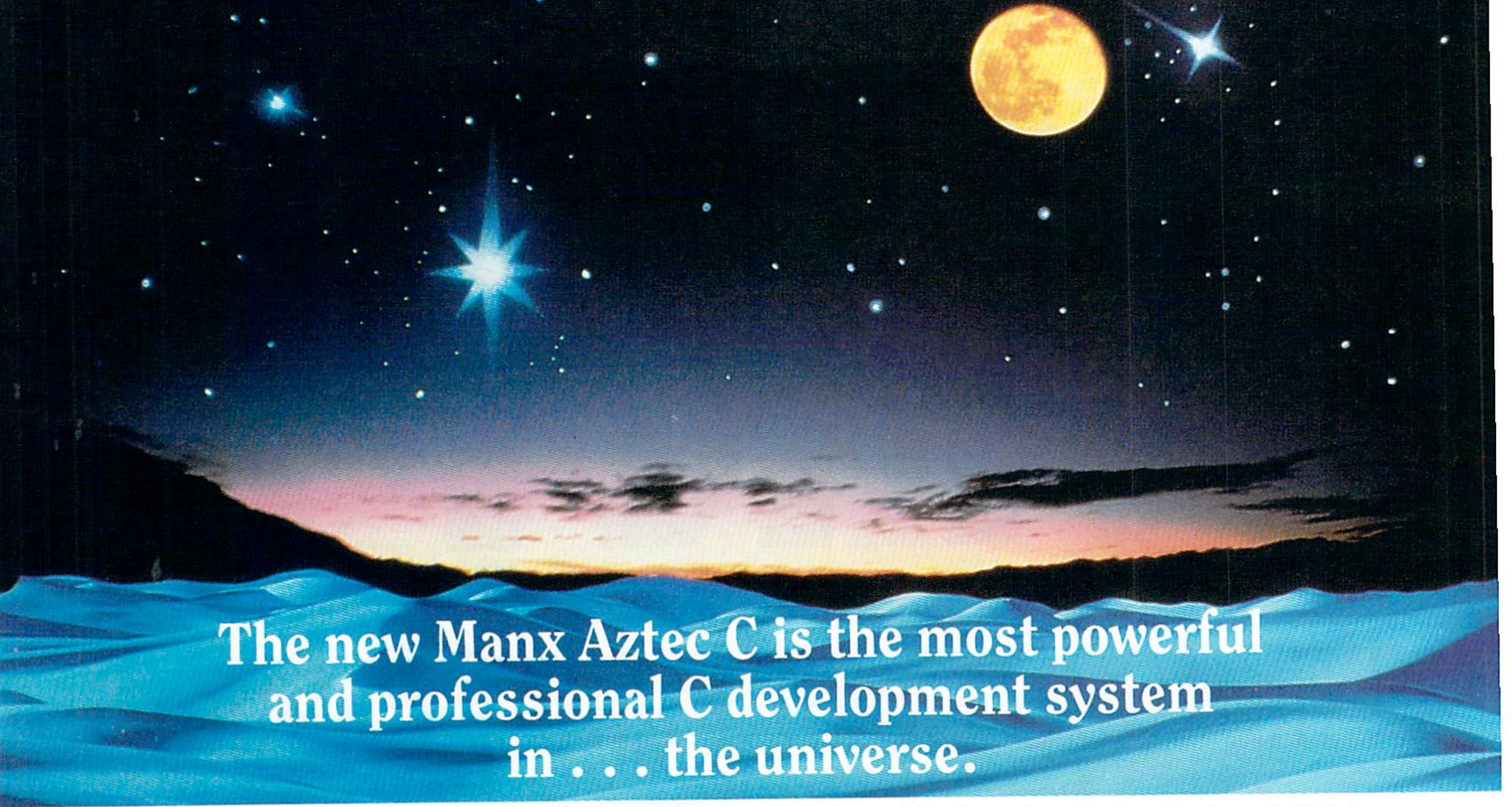
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Byte November, 1986

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Amiga World November, 1986

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Stockpiling Your Software: Amiga Hard-Disk Drives

Buried under a pile of floppies? Perhaps it's time to investigate hard drives. Relax, AmigaWorld *has done the hard work for you.*

By Mark L. Van Name and William B. Catchings

IF YOU'RE TIRED of disk swapping and restricted data access due to the Amiga 1000's hardware limitations, then you're probably ready for a hard-disk drive. In this info.phile, we'll take a look at some of the hard disks currently on the market that can boost the storage capacity of the A1000.

We asked all of the companies that advertise hard disks to allow us to review them. Five companies submitted evaluation units. The drives we evaluated are the Microbotics MAS-Drive 20 and the C Ltd. Hard Disk—the pioneer Amiga hard drives, and newcomers from Byte by Byte (PAL Jr.), Xebec (9720H) and Supra Corp. (Supra Drive). These products are designed for the A1000 and require version 1.2 of the Amiga's system software. Table 1 summarizes the basic information about each hard disk.

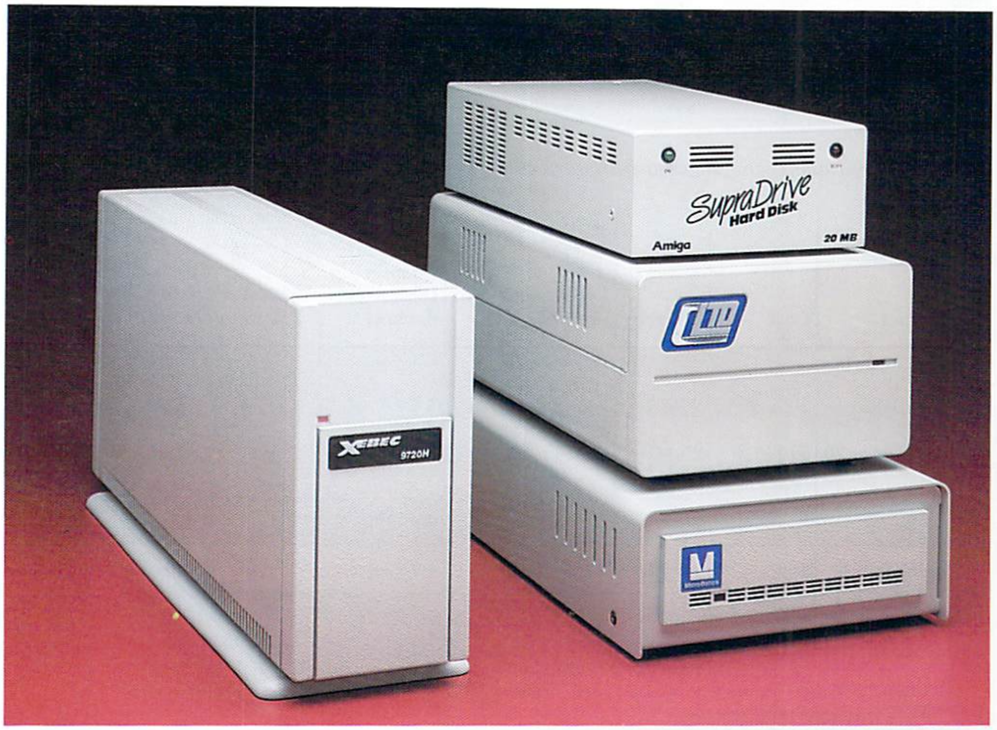
More Where It Counts

Hard-disk drives provide much more mass storage than floppy disks. All five of these drives offer 20 megabytes of storage—about 24 floppy disks' worth! They run faster than an Amiga floppy, so you do not have to wait as long to access files. All of this power requires surprisingly little effort. Once you have a hard disk installed, you treat it very much like a large-capacity floppy. You refer to it as DH0: rather than DF1: or DF2:. Though you cannot make a DISKCOPY of it, you otherwise operate much in the manner to which you are accustomed.

A few other limitations exist: Today, you cannot boot from a hard disk (we say *today* because many users have asked Commodore to remedy this situation). You still must use version 1.2 Kickstart and Workbench disks to get your A1000 running. However, you can edit your startup-sequence to ASSIGN the system directories to the hard disk. Once up, your system runs from the hard disk. All of these drives provide procedures that give you a new startup-sequence to set up your system.

Things to Think About

The large space offered by hard-disk drives is very easy to access. Because of this, and because you do not have to constantly shuffle disks, many users are tempted to ignore the need for backups; this temptation is augmented by the fact that making backups is just no fun. But, do it anyway! Though hard disks seldom break, when they do they may lose much of their data. Such losses often occur when the disk is jarred while running, or dropped while being transported. The heads that read the disk platters can then *crash* into the platters, ruining ►



Clockwise from left: The Xebec 9720H; Supra Corp. Supra Drive Hard Disk; C Ltd. Hard Disk; and MicroBotics' MAS-Drive 20. Not shown: Byte by Byte's Pal Jr.

all of the files there. This is the equivalent of 24 floppies going bad at once. Need we say more?

You can do a few simple things to minimize trouble. First, place your hard disk on a surface that does not vibrate. Try to keep it off the table where you keep your printer. Second, never move it while it is running. When you have to move the drive, use the Park utility that comes with the drive to disengage the disk heads so that they cannot crash. Finally, back up all of your important data files regularly.

Partitions: Many Disks in One

So far we have talked about hard-disk units as if each is a single, large floppy disk. While that is the default, you can divide disks into several logically distinct units, or *partitions*. Each partition is treated as a separate drive, e.g., DH0: DH1: and so on. All five drives we mention here support multiple partitions. Partitions provide smaller disk units, simplifying file management and backup. If you often work with a small number of files, keeping them in their own partition can improve your system's performance.

The main disadvantage to partitions is the work required to change them. You must first backup all of your files to floppy disk, repartition and reformat your disk drive and then restore the files. As formatting a hard-disk drive takes between 20 and 45 minutes, you don't want to have to set it up often.

Using partitions also requires that you make the appropriate entries in the Mountlist file on your Workbench disk. Each partition must be large enough for the biggest file it will ever need to hold, as no file can span partitions. Finally, each disk partition causes the Workbench to use additional RAM to manage it.

Hooking Them Up

The five drives we looked at offer the same basic capacities, come in cases that are either Amiga-beige or very close, have their own power supplies and can be set up fairly easily. All use basic drive mechanisms made by major manufacturers. Most of the units use a controller that conforms to the SCSI (Small Computer System Interface—pronounced "scuzzy") standard. By following this standard, they help ensure that your system will be able to grow and add other drives in the future, as the SCSI standard is a very popular one.

Four of the five units attach to the A1000 with an adapter that plugs into the bus expansion card on the right side of the system unit. If you already have other devices plugged there, such as a memory-expansion card, you need only attach the disk's adapter to the bus pass-through of that device. If that device does not pass-through the bus connection, put the disk adapter first and hook the other device to it. Be sure not to buy two devices without bus pass-throughs, or you will not be able to use them on your system at the same time. Two of these four units, the Xebec 9720H, from Xebec Corp., and the Pal Jr., from Byte by Byte, do not pass through the bus connection. The Pal Jr., however, is an expansion chassis that comes with the hard-disk drive, 1MB of memory, and one free Zorro expansion slot, so you can use it without needing other devices. All four drives work when attached to another device already using the bus (in our tests, a Comspec memory expansion card).

Unfortunately, anywhere from 10% to 20% of the existing A1000s (primarily earlier units) cannot handle more than one device attached to the bus expansion slot; if you have followed the directions for two devices very carefully and cannot get them to work together, you should contact your dealer. If necessary, your dealer should be able to help you get replacements for the responsible faulty parts, although this may end up costing you some money.

One unit, the MAS-Drive 20 from MicroBotics, does not use the bus expansion slot. Instead, it connects to the parallel port on the rear of the A1000. It comes with a parallel port pass-through on the rear of the drive, so you can still attach your printer. This design yields a slightly slower data access rate, and the device cannot follow the Amiga auto-config standard since it is not using the bus. However, the software supplied with the drive makes the installation about as easy as that of any auto-config device.

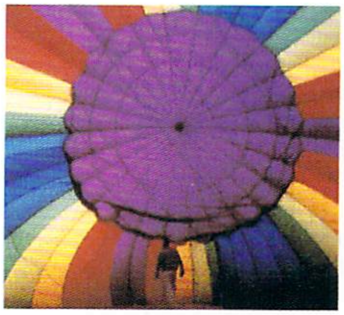
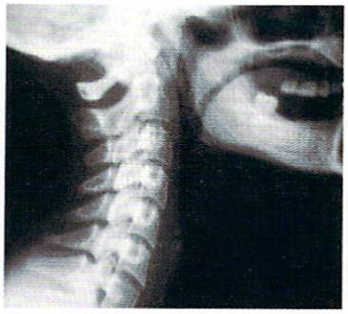
Installation

All five disks come with software that makes installation relatively painless. Not all of ►

Table 1. Specifications for Amiga hard-disk drives.

Product	Cost	Capacity	Dimensions (inches)	Adapter Dimensions (inches)	Power Supply	Top or Side Mount	Attaches To:	Pass Thru	Auto-Config	DMA Access	Cooling Fan	FCC Approval Rating	Works with Memory Expansion Board
C Ltd. Hard Disk	$999.95	20MB	6.25 × 13 × 4.25	1.5 × 8 × 4.25	Yes	Side	Bus	Yes	Yes	No	No	Class B	Yes
MAS-Drive 20	$1495	20 MB	7 × 14.5 × 3	NA	Yes	Side†	Parallel Port	Yes	No	No	No	None	Yes
Pal Jr.	$1495.95*	20 MB	17.5 × 13 × 2.75	0.75 × 7.5 × 3.75	Yes	Top	Bus	No	Yes	Yes	Yes	None**	Yes
Supra Drive	$995	20 MB	5.5 × 11 × 2.5	1.75 × 9 × 4.25	Yes	Side	Bus	Yes	No	No	No	None**	Yes
Xebec 9720H	$1095	20 MB	3.5 × 16.25 × 7.25	1.5 × 9.25 × 4	Yes	Side	Bus	No	Yes	No	No	Class B	Yes

*Includes Zorro expansion chassis and 1 MB of additional memory
**FCC rating in process
†Attaches with 6 ft. cable



Actual unretouched photos

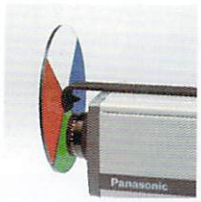
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* Digi-View software version 2.0 (or newer) required to use color camera. For maximum resolution use monochrome camera with 2.1 interlace. High-res color modes require 1 Meg expansion RAM.

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them follow the Amiga's auto-config standard, however: See Table 1 for details. Though all the disks worked well in our tests, it is, in our opinion, still useful to stick with standards, since standard hardware is usually unaffected by system software changes.

Hard drives differ in the means by which they move data between themselves and memory. Most use part of the CPU's time to handle requests to move information between main memory and the disk. One unit, the Pal Jr., uses a technique known as *DMA* (Direct Memory Access), in which the drive can move information without bothering the CPU. This approach requires additional, expensive circuitry, but it gives better performance.

Table 2. Performance Benchmarks

	DF1:	RAM:	C Ltd. Hard Disk	MAS-Drive	Pal Jr.	Supra-Drive	Xebec 9720H
SIMPLE TESTS (in seconds)							
Copy C Directory to RAM: from it (bulk file read)	46	8	23	24	13	20	22
Copy C directory to it from RAM: (bulk file write)	147	8	25	36	24	24	60
BRUCE WEBSTER'S TESTS (in seconds)							
DBench	262	72	129	176	132	132	140
DWrite	30	7	15	20	16	13	16
DRead	17	7	11	15	10	12	10
FISH DISK TESTS Written by Rick Spanbauer All file read and write figures in bytes/second							
File creations (/sec)	0...1	5	6	5	7	7	2
File deletions (/sec)	1	10	10	10	25	13	3
Directory scan (entries/sec)	36	5	51	47	42	49	45
Seek/read test (/sec)	17	51	55	36	75	53	48
Read 512 byte file	11702	201469	28807	14894	39125	22795	31968
Write 512 byte file	4818	131072	12977	10082	13443	16804	12192
Read 4096 byte file	12365	655360	34952	16697	55775	22795	37991
Write 4096 byte file	4974	262144	17712	9929	14894	19134	13239
Read 8192 byte file	12423	873813	34952	17022	55775	22795	38550
Write 8192 byte file	4955	262144	17712	10200	14894	19418	13239
Read 32768 byte file	12483	873813	34952	17133	56987	22795	39125
Write 32768 byte file	4964	291271	18078	10160	14894	19562	13306

Products are listed alphabetically by product name.
For comparison purposes, times are also shown for a standard Amiga floppy drive (DF1:) and for the RAM: disk.

Each of the drives offers some nice touches. The MAS-Drive 20 comes with a clearly-written single-page installation sheet that really is all you need to get going. The SupraDrive and the Pal Jr. include a battery backed-up, real-time clock. This eliminates the hassle of setting the time whenever you start up the Amiga. The C Ltd. hard disk came set up with a number of dealer software demos. It (and the Pal Jr.) included one of our favorite graphics demos: the animated Robot Juggler. Get your dealer to show this demo to you. The manual for the Xebec 9720H included a brief, but, for new users, useful explanation of how to use and maintain a hard disk.

Performance

A disk drive's performance is by no means dependent only on whether it uses DMA. Many other factors are involved, including the average access speed of the disk itself and whether the data is moved via the bus or the parallel port.

Disk-drive performance is an unavoidable—and often emotional—issue, and the one most buyers want most to discuss. It is also one of the hardest to characterize accurately. Different drives shine in different areas, as a close examination of Table 2 will reveal. Some are fast at reading data, but fall behind the pack when data is written to them. Others maintain moderate reading speeds but write data more rapidly. And, no two benchmarks ever measure quite the same thing.

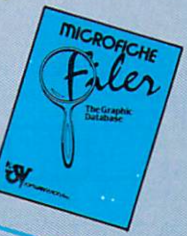
We ran three different, widely available benchmark sets. The first was a simple one that anyone can do: We measured the time it takes to copy the standard Workbench C directory both ways between the disk drive and RAM:. These two tests reflect a very common Amiga activity, i.e., moving common commands into RAM: to improve system performance. They test the movement of a large number of files that differ widely in size.

The second set of benchmarks was developed by Bruce Webster of *Byte* magazine and then placed into the public domain. The benchmarks consist of three components: dbench, dwrite and dread. All three work with 256 blocks of 512 characters at a time. dbench writes and then reads a sample file five times. dwrite writes a file once, while dread reads it. These tests measure simple disk throughput in both directions.

The final, largest set comes from one of the public domain software disks available from Amiga enthusiast Fred Fish. (These ►


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one of the submicros
of the plant cell wall —
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Companies List

C Ltd. Hard Disk
C Ltd.
723 East Skinner
Wichita, KS 67211
316/267-6321

MAS-Drive 20
Microbotics Inc.
811 Alpha Drive, Suite 355
Richardson, TX 75081
214/437-5330

Pal Jr.
Byte by Byte
9442 Capital of Texas Highway N.
Suite 150
Austin, TX 78759
512/343-4357

SupraDrive
Supra Corp.
1133 Commercial Way
Albany, OR 97321
503/967-9075

Xebec 9720H
Xebec
3579 Highway 50 E.
Carson City, NV 89701
702/883-4000

disks are commonly referred to as "Fish Disks.") The test program was written and placed into the public domain by Rick Spanbauer of SUNY/Stony Brook. The program performs many different tests. It creates and deletes many files, repeatedly scans a directory for its entries, tests the time required to locate (seek) and read data in files scattered purposefully around the disk, and reads and writes files of four different sizes, from 512 bytes to 32K.

Table 2 gives the results. As it shows, different drives excel on different tests, and no one benchmark, or this set of three, should be taken as a final authority. Given this warning, the Pal Jr. system seems to provide the best overall performance, probably due to its use of DMA. The SupraDrive and C Ltd. units beat the Pal Jr. on the test-file writes, but lose to it otherwise. The C Ltd. drive is the fastest non-DMA drive. Both the Supra and Xebec products turn in reasonable times, although not generally up to the Pal Jr. The MicroBotics MAS-Drive 20 provides the worst overall performance, probably because of its use of the parallel port rather than the bus, but it is not off by much from several of the other drives.

All five units provide a welcome relief from the slow speed of the Amiga's floppy drives. Unfortunately, the speed gains are only on the order of three to five times, which is less than many users desire. This sad fact occurs in part because AmigaDOS is extremely poor in its handling of disk drive I/O. While there are many rumors of new versions of AmigaDOS with faster disk I/O, there are no official statements from Commodore. In many cases, if you have the memory to spare, you can improve disk performance further with the AmigaDOS command ADDBUFFERS.

Your Cup of Tea

Typically this is where reviewers tell you that all of the products are just wonderful and that you will do well to buy any of them. We did it last time in our discussion of memory boards. It is true again here. All of these drives will improve your system a great deal.

However, we will make two firm recommendations. First, if you need both memory and a disk drive, buy the Pal Jr. It is the fastest disk drive overall. Its controller is "essentially the same" as the one in the A2000, according to a Commodore engineer. It uses Commodore's proprietary DMA chips and is the only DMA drive in our list. It includes 1MB of memory and an empty Zorro expansion slot. At $1,495 it is one of the two most expensive units, but if you consider the additional 1MB of memory and the expansion slot, it is priced comparably to the other drives plus a memory expansion card. Its only real drawback is that it does not offer any bus pass-through, so you must use the Zorro slot in it for any further expansion.

If you already have memory expansion, or if you simply don't have $1,500, we recommend the C Ltd. Hard Disk. It combines good performance with a relatively low price.

You really can't go wrong, though, with any of these drives. With the extra memory cards we looked at last time, and the hard-disk drives we have here, the Amiga now can meet an even greater variety of demanding computing needs. ■

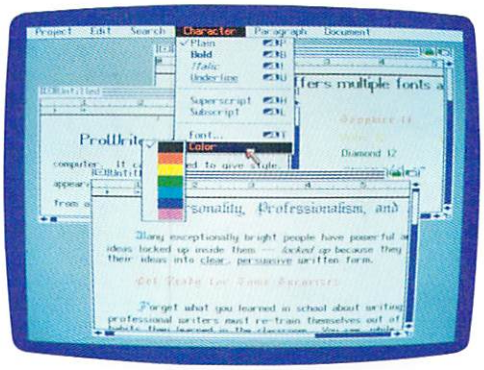
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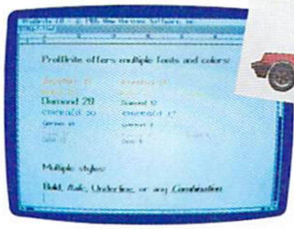
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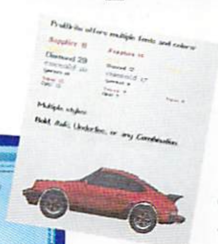
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Dear *AmigaWorld* Reader,

It is with great regret that I announce the postponement of the *AmigaWorld* Expo in San Francisco. Originally scheduled for September 11–13, 1987, the *AmigaWorld* Expo was conceived as a get-together for Amiga users and developers. Before announcing the Expo, *AmigaWorld* and World Expo, the show producer, obtained a commitment of support from the senior management at Commodore International to participate as the anchor exhibitor. As you may know, a management shake-up at Commodore in April resulted in the firing of many senior and middle-level managers, including the Chief Executive Officer and the General Manager. The new management at Commodore has decided to withdraw Commodore's commitment to the *AmigaWorld* Expo at this time.

Without Commodore's presence and support—in the form of speakers and machines for a hands-on exhibit—we at *AmigaWorld* feel that an exposition devoted to the Amiga would be a disappointment to exhibitors and attendees alike. An *AmigaWorld* Expo without Commodore's participation would not meet our standard of excellence for your computer show. Therefore we've decided to postpone the Expo until we can again count on the support of Commodore International.

My apologies to everyone who planned to attend or exhibit at the Expo. I hope to be able to announce new arrangements for the *AmigaWorld* Expo in the near future.

Sincerely,

Stephen D. Twombly

Stephen D. Twombly
Publisher

Circle 7 on Reader Service card.



A Musical Environment: The SoundScape PRO MIDI Studio

SoundScape's multitasking power and open-ended freedom

can turn your Amiga into a complete, personal music— production studio.

By Ben and Jean Means

Attention all you shower singers and musical pros—and everyone in between. You can now play the music that is in your head. After all the hoopla about the Amiga's sound chip settled to earth, there was still the unenviable job of creating software and hardware to take full advantage of it. The folks at Mimetics took on this Herculean task and came up with (fanfare please) the SoundScape PRO MIDI Studio.

Power Features for Power Users

Currently a sequencer, a sampler and a MIDI interface, SoundScape turns the Amiga into your own pro-quality personal music production studio, for under $300. Each facet can be used individually or in combination with the others. The Pro MIDI Studio 1.4 ($149) functions like a home recording studio, with an unlimited-track professional sequencer and a 16-channel MIDI mixer. The Sound Sampler ($99) turns the Amiga into a four-voice audio digitizer, which can sample and play back any sound. And the MIDI Interface ($49) allows the Amiga to send and receive note, clock and performance-control information to other MIDI synthesizers, samplers and drum machines, via your Amiga serial port.

When the three devices are hooked together, the Amiga becomes the heart of a system that can control an entire MIDI recording studio. Jim Saad of Sound Logic Studios in Los Angeles uses SoundScape with his 1.5 MB Amiga to control all the synthesizers and drum machines in his 16-track studio. He says, "It's the only sequencer I use in my studio, and in addition the Amiga balances the books."

But that's only the beginning. SoundScape can be multitasked with Electronic Arts' DeluxeMusic Construction Set for printing out a finished musical score. Also, you can write your music in traditional notation in DeluxeMusic Construction Set and do a full orchestral or rock group arrangement in SoundScape via MIDI editing. However, running SoundScape and DeluxeMusic Construction Set concurrently requires at least one megabyte of RAM.

As powerful as SoundScape is in the recording studio, it plans to revolutionize video production as well. Mimetics is developing a SMPTE synchronizer that will let SoundScape control sync to audio and video tape decks. This, combined with an animation program and a genlock, will let you not only record your next big hit album in your bedroom, but produce the videos for it as well.

Techno-shock at NAMM

Mimetics raised eyebrows at the Winter National Association of Music Merchants (NAMM) Show with SoundScape demonstrations of music and video multitasking. In the first demo, SoundScape simultaneously ran a Slide Show of Hold-and-Modify images and a song composed on SoundScape and played back with ►

ILLUSTRATED BY ROB COLVIN

sounds from the SoundScape sampler. Another demo showed the Amiga controlling and sequencing a bank of MIDI instruments while it also ran the stage lights. In the third demo, the Amiga synced a soundtrack to video via the soon-to-be-released SMPTE synchronizer. Music industry professionals went into techno-shock when they learned that the Amiga was running the whole show. And with extra RAM, the Amiga can run all three demonstrations at the same time!

But what does this mean to the average Amiga user who just wants to play a little music? With SoundScape and a 512K Amiga, you can sample some sounds, write some songs and have a lot of fun. When you decide to get serious, adding two megabytes of memory will bring your system up to professional quality.

Perhaps some of you are like me—you rushed out to buy the 1.1 or 1.2 version of SoundScape, only to be disappointed and frustrated by frequent crashes. Well, be of good cheer! The latest edition is very stable. (Mimetics is distributing the 1.4 revision free to all registered SoundScape owners.)

SoundScape is a very complex program with a variety of parts; be prepared to spend at least a week learning this program. Don't expect clear, unambiguous help from the manual, either; it's one of the least appealing parts of the package. Fortunately, a new manual with a set of tutorial "recipe cards" is being prepared, and Mimetics is putting out a newsletter, "Mimentos," with tutorials and a question-and-answer section.

The Brains That Drive the Brawn

Pro MIDI Studio 1.4 is the cornerstone of the SoundScape system. It creates a complete musical operating environment that lets you control a music system the way AmigaDOS lets you control your computer system. SoundScape is not a single program, it consists of many modules that combine to create the musical environment. Pro MIDI Studio 1.4 is the invisible soul of the system, the place where your customized musical system becomes a reality.

The visible heart of Pro MIDI 1.4 is the Patch Panel. Here, you connect the modules of your music system to suit your own needs. Currently, the available Patch Panel inputs are the MIDI Mixer, the QWERTY keyboard, the MIDI In and a MIDI Clock In. The available outputs are the Sampler, the MIDI Mixer, the Player Piano, the Tape Deck, the MIDI Out, and the MIDI Clock Out. Patches can be saved and recalled from disk, so you can tailor the Patch Panel settings for every song. You never again need to experience that terrible feeling of being locked into a matrix that doesn't suit your particular needs.

As Mimetics or others introduce new modules, including modules to integrate music and video, you'll be able to install them in the Patch Panel yourself. This is the greatest innovation of the SoundScape system, and the most important difference between SoundScape and most other computer music systems. SoundScape is an open-ended system, with the Patch Panel providing a simple and elegant way to integrate new modules into your system.

SoundScape's modular approach is similar to that used in New England Digital's Synclavier. In the late '70s, the Synclavier was just another digital synthesizer and sequencer, but the addition of modules has turned the Synclavier into a complete tapeless recording studio. Due to its modular design and the Amiga's multitasking capabilities, SoundScape could become the Synclavier of the '90s. Pro MIDI Studio 1.4 is merely the beginning.

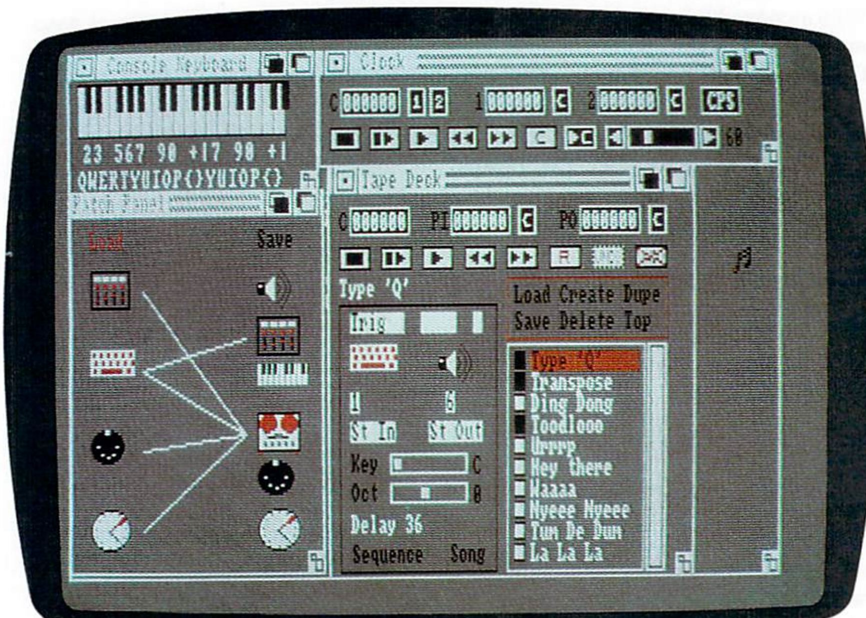
Breaking the Track Limit

The Tape Deck gives you not eight tracks, not 16 tracks or even 24 tracks, but an *unlimited* number of tracks to record on. Your only limitation is the amount of available RAM, which can be increased according to your budget. With 512K, you can store about 7,000 notes on these tracks when not using samples. With two megabytes, you can use up to a whopping 32 seconds of samples while playing an entire concert or symphony completely from RAM memory with no disk-loading.

Inputs to the Tape Deck commonly come from the QWERTY keyboard or from your synthesizers and drum machines. The QWERTY keyboard can produce a 128-note range, compared to a grand piano's range of 88 notes.

You have the option of inputting your notes in real time or in step time. Real time is used when you simply want to record the piece as performed; step time is used when you want to enter the notes individually with precise time values. Using step time, you can create notes that will last as long as the duration of the song or as short as a 384th note (using 96 clocks per quarter note resolution).

Besides the standard controls (Stop, Play, Rewind, Fast Forward, Record and a tape counter), the Tape Deck sports professional features like the Play from Beginning button, which instantly rewinds the Tape Deck and starts it playing. The Punch In and Punch



SoundScape windows containing the patch panel, tapedeck and console keyboard.

Out controls allow you to precisely record over one part of a track while leaving the rest unchanged; this is very handy when you want to correct a few wrong notes. Also, the two Autolocate buttons will take you instantly to any place in your piece.

The track architecture is very flexible, with play, record, echo, match, transpose and trigger modes. Each track has its own set of MIDI In and Out filters and a name of up to 12 characters. You can record a track on any one MIDI channel, which can be changed on playback. You can transpose tracks to another key by up to 11 semitones and set them to any octave, either during recording or on playback. You can delay a track to start playing at any desired part of the song, mute it entirely or instantly duplicate it.

Recording has come a long way since the Beatles recorded *Sergeant Pepper's* on a pair of four-track tape decks. The industry standard is now 24 tracks, with several 32-track machines on the market. But SoundScape has broken the track limit and electronically done away with tape. The only time you'll need tape is for final mixdown or to add acoustic instruments.

Dipping into the MIDI Note Stream

Once tracks are recorded, they can be modified in the Edit Sequence Window. Here, the notes from your track are displayed, showing the name of the notes, when they begin and how long they last. Each note can be fully edited. The time the notes begin can be displayed in MIDI clock numbers or in beats and measures. In the beats and measures mode, you can use any simple or complex time signature, and if you're wild about polyrhythms, each track can have a different time signature.

If your timing was a little sloppy when you performed the track, you can time-correct it with the Quantize feature, defined in any number of MIDI clocks you wish. Quantizing is of the "note on" variety; in other words, only the time a note begins is corrected while the length of the note remains the same. This is fine as far as it goes, but Mimetics still needs to add a few features. One nice feature of the Quantize module is that sequences can be edited to create an endless loop. This is convenient for figuring out lead and melody ideas over a repeated rhythm or bass accompaniment. SoundScape's Program Designer Todor Fay is currently developing a complete Quantizing module with global Quantize.

Tech Heads Corner

All right, here are all those specs you've been waiting for. (Sane human beings without a coffee cup grafted to one hand and a calculator grafted to the other can skip this section.) SoundScapes's default clock rate is 24 clocks per quarter note (cpqn), but it can also run at 48 and 96 cpqn. At 24 cpqn, you get a clock range of five to 600 beats per minute (bpm), at 48 cpqn, a clock range of 2.5 to 300 bpm; and at 96 cpqn, a clock range of 1.25 to 150 bpm. At 96 cpqn, the smallest increment is a 384th note. Still not satisfied with the res? Mimetics is considering offering direct access to the note stream just like the Amiga sees it—in microscopic sections. And by the way, tempo changes are programmable via a control track.

Running into the Wall of Sound

Once you've recorded all those great tracks and edited them to perfection, you can assemble them into songs in the Edit Song Window.

Most sequencers only allow you to string songs together in straight block format, like a single row of bricks. SoundScape however, lets you overlap sound blocks of any length and any time signature. Instead of a row of bricks, you can build a solid wall of sound. This unusual approach allows the composer to explore new techniques of composition that were impossible with previous sequencers.

The current Edit Song Window is clumsy, however, in the way it names the tracks you import to it and because it can only edit one track at a time. Mimetics promises separate modules tailored to different editing applications. In fact, a new Edit Song Window should be available by the time you read this.

The only time you'll need tape is for final mixdown or to add acoustic instruments.

Special Effects

The powerful Special Effects Track Modes allow you to play back your tracks in several ingenious ways. Echo Mode starts a copy of a sequence each time you press a key. The program checks the distance from middle C of that key, and starts a new track transposed the calculated distance from middle C each time a new key is pressed. This can create huge textural washes a la Phillip Glass . . . or total chaos. When used tastefully, the results of Echo Mode are fabulously hypnotic.

Transpose Mode checks the distance from middle C just like Echo Mode, but instead of starting a new sequence, it transposes the key of any tracks you select. Trigger Mode starts a sequence playing each time its first note is played, which is great for placing short accent lines within a piece.

Finally, Match Mode, used with the Player Piano Module, gives you a visual performance feedback system to help you learn music more easily. Notes from the tape deck are shown on the Player Piano for the first note or notes of a piece you want to learn. When you press the right key or keys, Match Mode proceeds to the next note and so leads you through the whole piece. Also, if you want to see your teacher's notes while you are playing, you can set the Player Piano to two different channels of display. The Piano will show the notes you play in red and your teacher's notes in gray.

Soundscape Passes the Audition

SoundScape is the first attempt at a comprehensive Pro MIDI Sequencer for the Amiga, and it is satisfyingly complete. The program is very solid and logical in its conception; the modular approach sets the Pro MIDI Studio apart from other sequencers.

With the rapidly-expanding demands of musicians, many sequencers quickly become obsolete. Product life cycles have been shrinking since the introduction of MIDI in 1983. While many other sequencers will ►

become outmoded, Pro MIDI Studio will be able to keep up with user's demands by simply adding new modules.

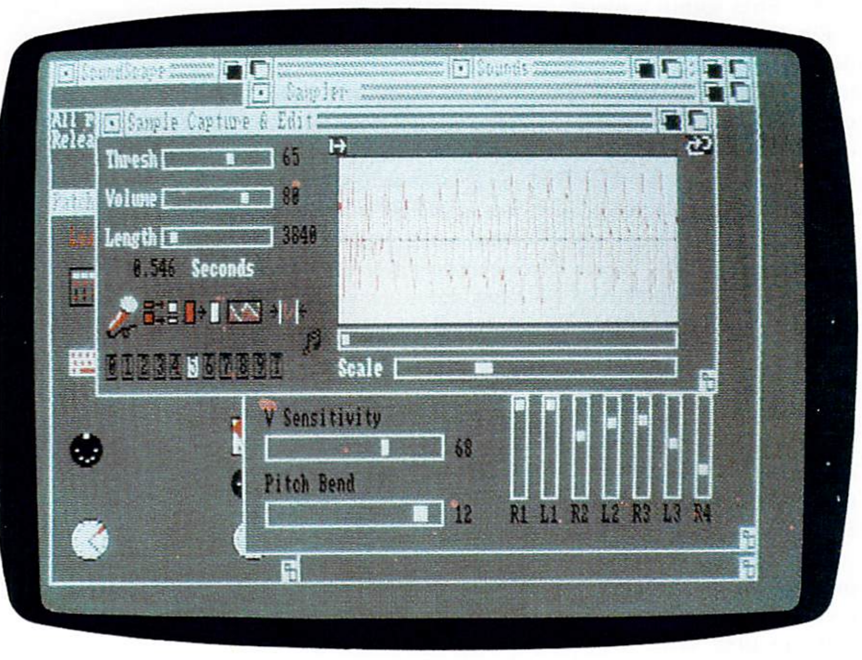
The other powerful component in this musical equation is the Amiga's multitasking ability. In the past, sophisticated uses of MIDI music processing and graphics required several computers or sequencers. Interfacing these devices has been an ongoing headache with enormous costs. Pro MIDI Studio unleashes the power of the Amiga to run all of your music and graphics from one computer at the same time.

The Sound Sampler: All the Noise That Fits

The Sound Sampler turns the Amiga into a four-voice, eight-bit companding (compression/expanding) sampler. Most other samplers are fun musical toys, but the Mimetics Sound Sampler is a useful musical tool, which costs just $99. To put this in perspective, just five or six years ago top music professionals were gladly paying $30,000 for the original Fairlight Computer Music Instrument (an eight-bit system). Now the Fairlight has gone to 16-bit to keep up with the Compact Disc 16-bit standard, and the base price has skyrocketed into the $65,000 realm. But as an introduction to sampling (and as a way to keep $64,000+ in your pocket), eight-bit still has something to offer, as Mimetics' Sound Sampler proves.

Since eight-bit sampling only offers 256 level values with 1% distortion (compared to 16-bit sampling, which has 65,000 levels with .007% distortion), the sound quality is more like your Walkman than your CD player. However, with careful sampling and editing you can fool your ear into thinking the quality is closer to a 12- or 14-bit system. The Amiga only has about a 4K frequency range, so high instruments like cymbals don't play back well. But mid- and low- frequency instruments can sound great.

SoundScape's sample capture and edit window.



In case you buy Pro MIDI Studio 1.4 without the Sound Sampler, you can buy some ready-made samples to install and edit in your system. But the real fun is when you courageously take your microphone or line level (not included) to the mat and make it squeal! Forget music for a second—I'm talking sounds! Let's be honest—I'm talking Noise! What you can do with common household noises and the Mimetics Sound Sampler is hilarious. Your dog, your kids, your pots and pans. Dishwashers, lawn mowers, phone calls, bouncing balls, kitty cats, baseball bats. . . let your imagination and your ears go wild! Turn all these into instruments; then, play them along with your songs. In my latest effort a chorus of breaking bottles, ringing crystal glasses, thumping cardboard tubes and a motorcycle accompanies the guitars, bass and synths.

The hardware part of the sampler is a black box about the size of a bar of soap that plugs into the second mouse port. It accepts mono or stereo RCA line-level inputs or a mono mini-phone plug microphone-level input. The current software only supports mono playback.

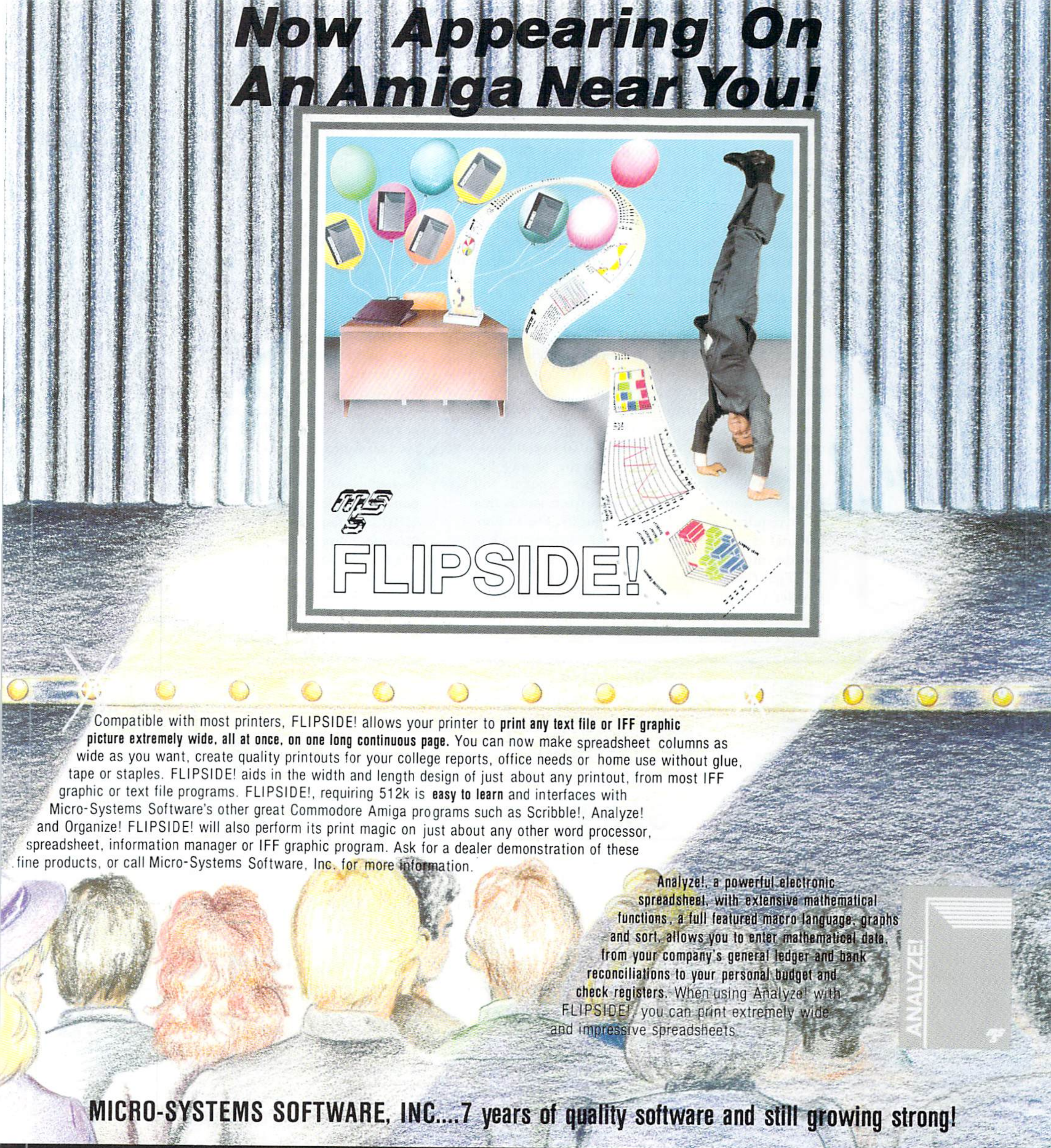
The Sound Sampler can hold up to 160 different samples in RAM memory all at the same time! To take full advantage of all those samples, you'll need extra RAM. The Amiga only uses Internal Chip memory for samples. That's about 460K after the initial boot when using external RAM; so at the fast sample rate of 14K, you can have about 32 seconds of sampling time. At the slow sample rate of 7K, you have a little over a minute of sampling. On a 512K Amiga, you will have about 12 seconds of sampling at the fast sample rate of 14K and 24 seconds at 7K. This decreases to about four seconds of sampling time when you use the Pro MIDI Studio along with the Sampler, but you can do a lot with those four seconds!

Sampling occurs in the Sample Capture and Edit Window. There, samples can be translated by octave, recorded compressed or non-compressed, displayed with an oscillograph and have their start and loop points edited. Besides modifying an existing waveform, you can draw your own from scratch. Each sample can then be tuned, transposed, changed to another octave, adjusted for key velocity, set for pitch bend and enveloped by a three-level, four-rate ADSR that has its own visual display.

The oscillograph display can be adjusted to show the entire sample or just a few cycles of it. This lets you figure out where to place the loop points. These loop points set the part of the sample to be repeated so that a sample of any length can be sustained indefinitely.

Each sample plays back over an 11 note range; so to make a complete instrument, you can either translate the sample into other octaves or resample the sound source playing an octave higher or lower. Some sounds become very bizarre when translated. Spoken words translated up an octave give the Alvin and the Chipmunks effect, while translated down an octave they end up sounding like King Kong muttering in his sleep.

Don't be disappointed if your first attempts at sampling don't sound just like the grand piano you were ►



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trying to capture. Making high quality samples with seamless loops is an art even on high-end systems.

The MIDI Interface

The MIDI Interface is the simplest part of the system. It connects to the Amiga serial port via a short cable and provides MIDI In, Out and Thru connections, allowing the Amiga to talk to the world of MIDI synthesizers, samplers, sequencers and drum machines. From now through September 15, 1987, Mimetics will give you a free MIDI Interface when you show proof of purchase of a Pro MIDI Studio 1.4, Sound Sampler and DeluxeMusic Construction Set.

Now and For the Future

By the time you read this, the first SoundScape Utility Disk containing six new modules to install in the Patch Panel should be available for $49.95. The Mousebender will give mouse control over pitch bend, vibrato, tempo and other MIDI functions. The Mapper/Splitter will change any MIDI input into any MIDI output and send it out on any MIDI channel, taking the "If only I could. . ." out of your system forever. Systemx will save and recall synthesizer patch banks from synths that don't require handshaking or requests. The Frame Counter is a film-scoring tool that converts track information into a "hit list" shown in seconds and frames. The Fuel Gauge maps available memory. The Clock Divider changes MIDI clock ratios and is useful for sending clock information to drum machines when in hi-res clock modes. Mimetics promises to introduce many more module disks.

SoundScape is also offering a Developer's Kit ($150). If you are a reasonably proficient C-language programmer, you can program your own custom modules to plug into SoundScape. And a simplified Developer's Kit is on the drawing board that will allow amateur programmers to create simple modules.

Desktop Recording

A whole new age of media communications is coming. It started with the birth of desktop publishing. The new age of music will witness the birth of desktop recording and video production. And SoundScape is one of its most important heralds, creating better music more cheaply than ever before. ■

Ben Means is a recording engineer, producer and songwriter and has his own 12-track recording studio. Jean Means writes and has her own public relations and promotion firm. Write to them c/o AmigaWorld, *80 Elm St., Peterborough, NH 03458.*

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512K required.



Any car enthusiast can tell you that a performance auto is made up of many parts. Each individual piece must be high-performance for the complete car to be high-performance. For example, a car that can do well in excess of 150mph would be very limited by tires that were only rated for 80mph. The same is true with your Amiga™ Computer. The Amiga is a very high-performance computer, but can be severely limited by the speed of its floppy disk drives. Much of the time, your computer sits there idling while loading data from the disk. This also makes you idle and greatly decreases your productivity.

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■ VizaWrite is well behaved, allowing you to use the multi-tasking capabilities and run several programs simultaneously.

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■ VizaWrite comes ready to run, no installation of the software is required and will run in 256K of RAM on one or more drives. Comes supplied with Workbench 1.2 and requires Kickstart 1.2 or greater.

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■ Edit and save any standard ASCII file. All character codes above the space character can be used in a document. Supports all international characters.

■ VizaWrite documents retain pertinent information when saved - such as author, creation date, notes, alteration count etc.

■ Open as many documents onto the screen as will fit into memory. VizaWrite uses memory extremely efficiently, and works with the AMIGA operating system in the standard way.

■ Mail merge from a standard ASCII file with configurable item delimiters. Alternatively, mail merge from a VizaWrite document, where each name and address is held in its own page.

■ Optional configuration file permits the varying of many operation defaults, such as standard document size, screen colors, margins, tab stops, etc.

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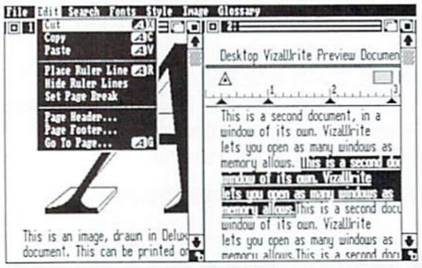
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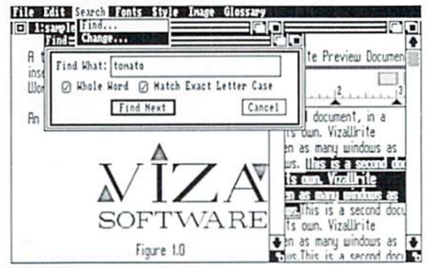
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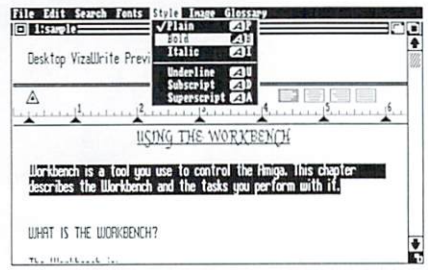
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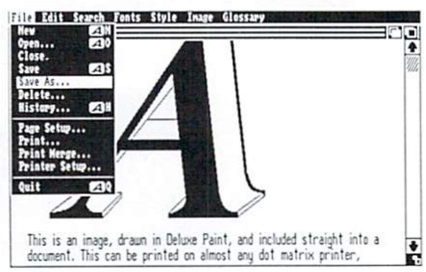


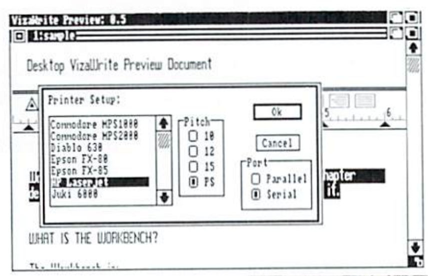
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B. B. KING

KING OF THE BLUES

B. B. King doesn't have an Amiga; he has two of them. "I got the first one about a year ago," he told me from a New York hotel earlier this year, where he was preparing for a performance, "But I got so lonesome for it when I was on the road that I had to go out and buy another one." That's pretty high-tech for a man who had to borrow $15 from his boss on the farm to buy his first guitar.



Popular music wouldn't be the same if he hadn't bought that first guitar. King picked cotton on the Mississippi Delta before hitch-hiking to Memphis, a regional music center in 1944, at the age of 19. There he became "The Beale Street Blues Boy" which was soon shortened to "B.B." as he accompanied himself with that guitar on streetcorners for spare change, which is how many blues performers of the period built reputations. Like all perfectionists and true originals, however, King was different. Over the ensuing years, he extended and heightened a popular musical form, the 12-bar blues, incorporating the freedom of jazz with the soul of gospel, synthesizing a style that is uniquely his own—a style that has been imitated and acknowledged by his contemporaries.

Caledonia and Commodore

B. B. King owns several computers (a Commodore 64, Compac and Tandy Color Computer) but the Amiga was the first to hold his interest musically. He has Music Studio, Soundscape ProMIDI Studio and was playing with DeluxeMusic Construction Set when I talked with him. "I use it primarily for learning songs," he said. He enters melodies from sheet music and then plays along in real-time with Lucille, his famous electric guitar. He likes to mouse-in harmonies, too, and do his own arrangements, but he finds four sound channels restrictive. "It's real useful and lots of fun. When I want to use a more complex chord, say a 9th or 13th, sometimes I leave out the fundamental tone." (That's because our ears and brains, wonderful mechanisms that they are, will often supply the fundamental pitch when the rest of the chord is present.) "But I'm thinking about getting one of those things that gives you more voices," he said. I wondered if he knew of a way to produce more internal voices, but it turned out he was referring to a MIDI interface and a synthesizer.

He told me about a composer/arranger friend who puts his music on disk in his apartment and then takes the disk to a recording studio, but he didn't seem intimately familiar with MIDI. When he mentioned that he wasn't comfortable using a piano-type keyboard, I told him about the new MIDI guitar pick-ups that replace keyboards for input, and he seemed very interested.

The Thrill is Back

King calls himself a blues singer, but he's much more than that—more like a legend. He has been the undisputed King of The Blues since his masterpiece, "The Thrill Is Gone," sold over a million copies in 1967.

Whatever you call him, B.B. King is the consumate performer, having played to over 17,000 audiences, once doing 360 concerts in a single year. He used a "crybaby" guitar foot pedal in "Lucille Talk Back," but says that's the only electronic instrument he has played professionally. (His keyboard player uses a Yamaha DX7.) Considering the heights to which he has taken Lucille and his voice (not to mention his back-up orchestra) both literally and figuratively, it will be interesting to see what he does with the Amiga professionally.

King is a self-taught musician, yet he has spent a lifetime performing all over the world, garnering just about every musical award there is. His interest in music began when a preacher back in Mississippi taught him three chords: I, IV and V. "And you know what?" he asked me rhetorically there in New York, "I'm still playin' em."

"On the Amiga?" I asked.

"On the Amiga," he said with a grin.□

—Peggy Herrington


WILLIAM LOW 1987

DeluxeMusic Construction Set:
Scoring High On a Scale of A to G

If you want standard music notation to be your forte,

or if it already is, you'll score with DeluxeMusic.

By Peggy Herrington

DeluxeMusic Construction Set from Electronic Arts is the most accurate and flexible note editor I've used on any microcomputer, or for that matter, any computer.

But it's not perfect. The first release of DeluxeMusic (late '86) has some problems: The worst appears when you try to save a score to a disk with insufficient free space (a condition you cannot ascertain from within the program). The program empties the original file, if there was one, and makes it impossible to save the new file—you can play and edit, but Save and Save As won't work. Although you probably wouldn't think so, the score *can* be saved as a SMUS file. Also, entering music in step-time from a MIDI-connected synthesizer summons a "performance" by a Guru more often than not.

If you bought an early release, these and other less fatal flaws are fixed in an upgraded program disk and addenda you can request from Electronic Arts.

The Programme

DeluxeMusic is nothing if not elaborate. It provides up to eight staves, each holding two rhythmically separate parts differentiated by note stems going up or down. You can play music with eight Amiga and MIDI instruments using four Amiga samples (memory permitting) and four MIDI; more if you double-up on channels or exclude the Amiga. Each staff carries its own instrument and is playable and printable alone or in combination with any of the others.

Computers are notorious for making mechanical, regimented music, but not with DeluxeMusic. It implements treble, tenor, alto or bass clef on any staff, uses ties for extended durations, accommodates triplets and fives of whole to 32nd notes and rests. Amplitude changes from ppp to fff can take effect gradually or be assigned abruptly to each note. Tempo, time and key signatures affect all staves, but, like clefs and instrumentation, can be changed at the beginning of any measure.

As a dedicated note editor, DeluxeMusic offers more editing features than Music Studio and Sonix combined and lets you do something neither of them will: You can edit the actual notes *while* the music plays, rather than only the score's transposition, tuning and tempo. It prints scores, too. Notation is accurately reflected both onscreen and on paper. You can place titles, cred-►

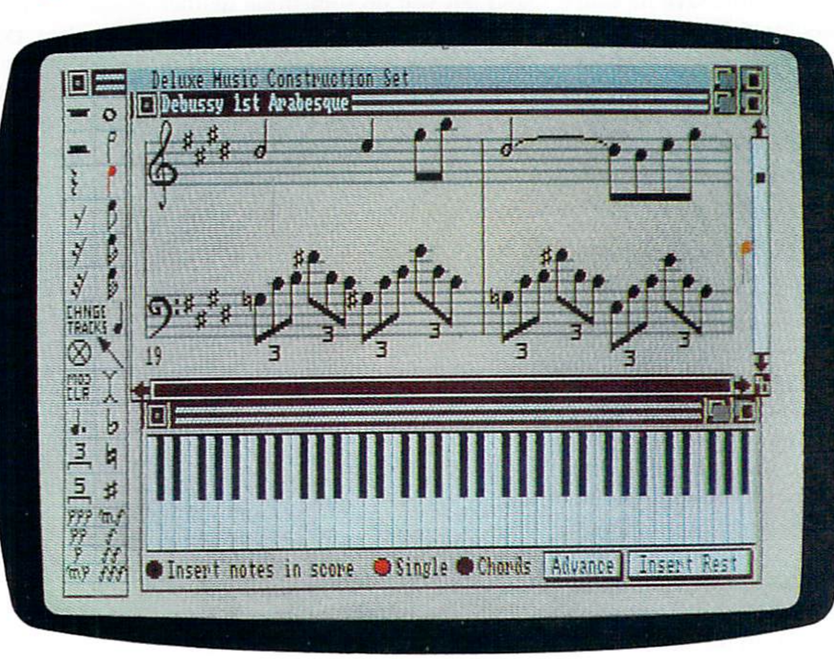
ILLUSTRATED BY WILLIAM LOW

its, lyrics and instructions along with non-playing music symbols and guitar tablature anywhere in a score, even on the lines of the staves, without interfering with playback.

I am very disappointed that DeluxeMusic doesn't accommodate a laser printer, which is a must for professional scoring. Although the print-outs are better than those from Music Studio or Sonix, they are blocky, jagged things that I wouldn't use professionally. Notation is in 640 × 200 screen resolution and can be printed with a graphics-capable printer. (I tried a Seikosha SP-1200AI and a Xerox 4020.) Space can be adjusted for text, lyrics and symbols. Two types of non-playing fonts are available, guitar fret tablature and non-playing music symbols; the addenda available from Electronic Arts explains how to use them. The upgraded program fixes bugs in the original that leave space where a part you don't want printed would have been and that create staff lines of uneven thickness.

Power Windows

While it is similar to the Macintosh version, Amiga DeluxeMusic uses color, pull-down menus, mouse and keyboard commands to advantage. Underlying the program's flexibility is its construction. Unlike screen devices that inhibit input when open, windows let you do several things at once such as play and change a score. Three windows are present at start-up: A score window that is expandable over the entire screen, a palette of music symbols and a representation of a six-octave piano keyboard. These latter windows can be closed, moved about freely or placed behind the score. Available through a pull-down menu is the score set-up window where you establish the tempo (changeable at measure boundaries), number and spacing of staves, set the number of measures and their width for screen or printer output, and so forth. Time and key signature windows offer all possible combinations.



DeluxeMusic's Score Editing Screen.

Before you use a note editor you must, of course, write the musical score. This can be done in three ways with DeluxeMusic, and techniques from one method can be combined with those you prefer from the others. When a symbol on the music palette is clicked on, the pointer becomes the symbol. You then move it to the appropriate place on the score and click the mouse button again to enter it. This isn't as tedious as it sounds because you return the pointer to the palette only when you want to change symbols. Clicking the pointer on the on-screen piano keyboard, enters the corresponding note alone or in a chord on the staff. Number keys are used to change durations (2 is a half note, 4 is a quarter note, etc.). The final method of entry is pressing a key on a MIDI-connected synthesizer in step-time. Duration is altered with the number keys, from the palette, or you can hold the key down to lengthen it. Music cannot be entered from an attached synthesizer by playing in real-time—that is done with a sequencer, not a note editor.

Accurate Notation

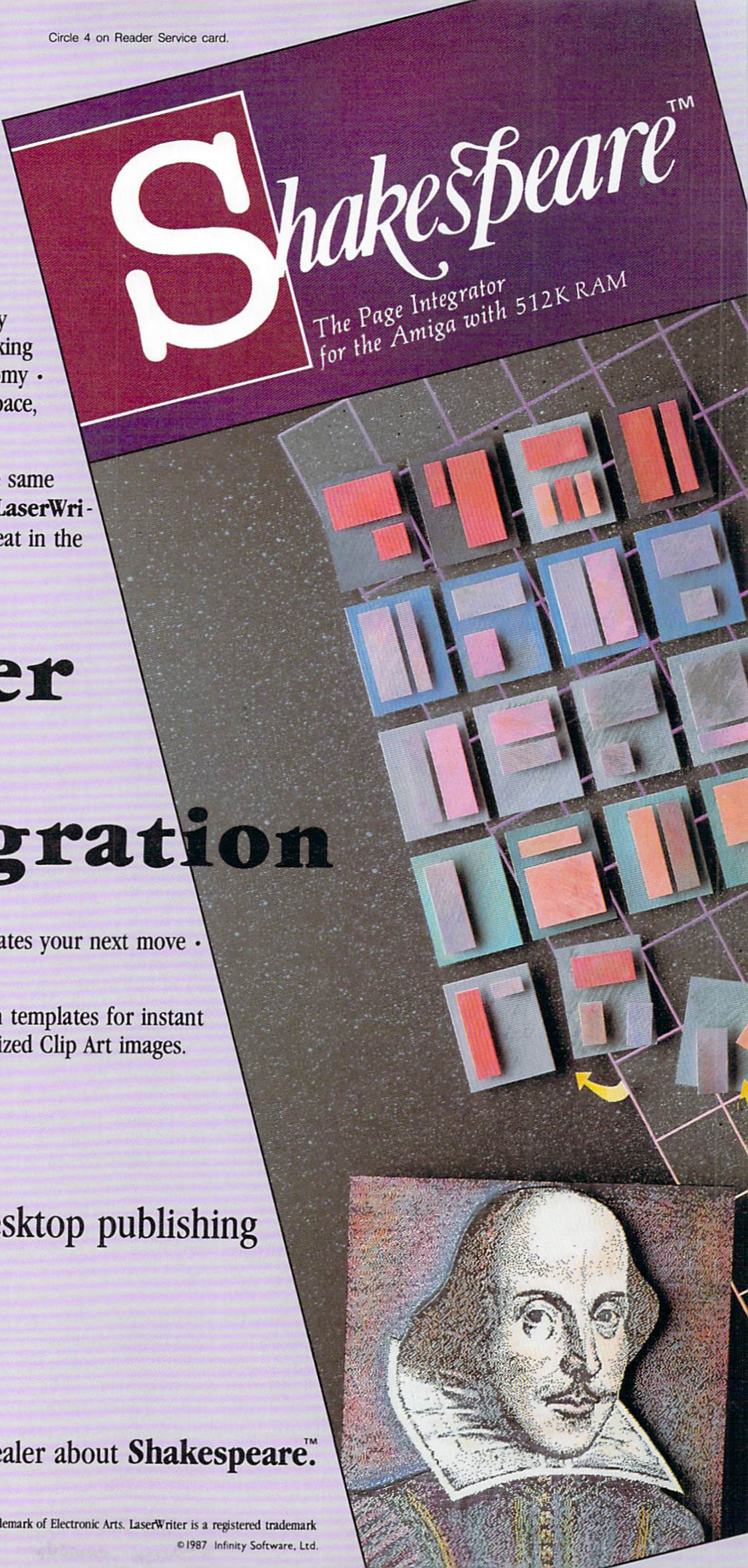
Once you have entered some music, you can highlight notes individually or in adjacent groups and alter them with menu selections or appropriate left-Amiga key combinations. For example, stems can be flipped (Amiga-F) and notes of the same pitch tied (Amiga-T) in series across bar lines. Highlighted groups can be beamed (Amiga-B), transposed up or down by whole, half-steps or octaves. Durations can be doubled (Amiga-D) or halved (Amiga-H) and chords inverted. To alter a pitch, you simply move the note up or down the staff as it sounds, releasing the mouse button when it is in place. Accidentals and the ubiquitous musical dot can be added from the palette.

When it comes to accuracy of notation, DeluxeMusic is surpassed by none. You can move through a score in one long string or flip it by pages. Up to 10 measures can be shown on the screen or a single measure can be stretched across it for detail work. You aren't confined to fixed-note spacing, and space above and below each staff is adjustable. A scroll bar slides the music up and down on the screen, which is handy for working with multipart scores. The clipboard is used for editing sections with cut, copy and paste so that repeated parts need be entered only once. You can copy and insert sections of music from one staff to another (it is automatically transposed if you move it to a different clef) or conserve memory with repeat bars and first and second endings. Crescendos and diminunendos are spread over groups of notes for graduated volume control.

Orchestration

DeluxeMusic comes with 15 good IFF-sampled sounds called Accordion, AhhVoice, BuzzSynth, Clarinet, ElecBass, Flute, HollowSynth, JazzGuit, Percussion (five different sounds), PhaseSynth, Piano, PipeOrgan, StratSynth, Strings and Trumpet. Each can be loaded into memory and assigned to a staff at the beginning of any measure. Since samples are big, you'll probably hanker for expansion memory if you like variety, al- ►

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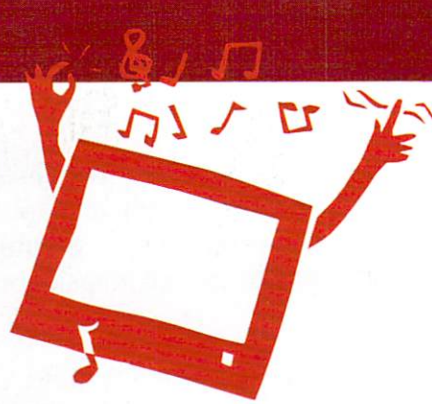
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Deluxe Tips and Tricks



MULTITASKING WITH DeluxeMusic is possible with expansion RAM if you boot from another Workbench disk or put C directory commands on your DeluxeMusic working disk. (Free space by putting the music and instruments on other disks.)

Experiment with play styles. Using #5 (fast deep vibrato) with a guitar sample sounds a lot like bending a string and is particularly effective with FuzzGuitar from It's Only Rock 'N Roll. A slow attack (#15) on a longer note comes close to a trill, and play styles #12 and #14 dramatically improve piano sounds.

Instruments should be "set" or assigned in the order in which they are loaded and appear on the pull-down menu. That's why they all move up on the staves if you remove one. Since there's no way to insert one in the menu, sometimes it's easier to remove and reload them all as you orchestrate.

Keep scores and instruments on separate disks. To load instruments from a second disk, you must introduce that disk *before* you load the score by pretending to load an instrument from it and cancelling at the last minute. (It is of primary importance to leave a disk in the drive until the red light goes out. If you eject one prematurely, chances are you'll be singing the blues with a hard sector error.) Although undocumented, you *can* save sections of music or combine scores by copying the part you want. (Free memory for this by deleting instruments.) Then you can save, load or clear the score window and the copied part will still be there waiting for you to paste it wherever you wish. This lets you insert bass lines, chord progressions and riffs in scores without having to re-enter them.

Because timing is strictly enforced, computer programs can't usually handle things like retards, pick-ups and grace notes. DeluxeMusic will accommodate them in a separate measure if you fool around with the time signatures.

Hundreds of transcriptions and lots of samples from talented Amiga musicians are available on commercial networks, electronic bulletin boards and from user groups. Since it's permissible to use copyrighted music in the public domain, there's everything from rock to classical. Some arrangements are done exceedingly well, especially those by Chuck Hawes and Xanthar.□

though 512K is sufficient for four samples with most popular songs. Only one sample can be assigned per staff, but you can copy a part to another staff and assign a different sample for more complex sounds. Just remember that the Amiga can play only four at once.

Electronic Arts produces It's Only Rock 'N Roll ($39.95), a utility disk for their music programs. It has 27 samples, only three of which are similar to those in DeluxeMusic. The 19 samples from Instant Music (six of which are DeluxeMusic duplicates) are compatible as well. The samples are very good, but the songs on these disks are singularly unimpressive. They have been improved substantially on the Deluxe upgrade but still leave something to be desired. Other music files and samples are reviewed in this issue, but most of the samples play an octave low in DeluxeMusic. According to Bob Hoover, co-designer of the Amiga ROM kernal, this is because the IFF music "standard" (which really isn't) doesn't specify octave numbers. It isn't a big problem as DeluxeMusic will play any or all staves an octave higher or lower than written.

Electronic Chops

DeluxeMusic will only play IFF samples (real-world sounds recorded digitally); you can't design your own sounds with it. However, samples can be tailored during playback with 16 different play styles that can be applied to groups or individual notes. Traditional musicians develop technique through years of grueling practice but DeluxeMusicians show their chops by inspired instrumentation and use of play styles. Don't underestimate them; selecting the right instrument and using the right play style makes the difference between a lifeless and a brilliant performance. The same instrument can sound plucked, or played smoothly legato with vibrato or portamento. You can adjust play styles with tempo and amplitude changes until your piece is arranged exactly as you want it.

The Performance

The score is displayed during playback. Static screens of notation follow one another and keep up with the music if you're reading it (even with the sounding notes being flashed in red), but are not quite fast enough to play along with on an instrument. You'll be disappointed if you like stereo because voices switch back and forth between speakers depending on which channel is free. Parts are often broken between speakers; Electronic Arts recommends you play DeluxeMusic monophonically. (This is a problem with the Amiga itself as other Amiga music programs do the same miserable thing.)

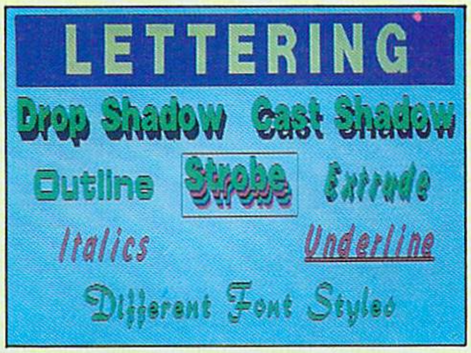
A show memory feature tells you how much is left and reflects only internal "chip" memory—the 512K area in which all music and graphics data must reside. Without expansion RAM, there are about 100K free. With it, some of the program is moved into fast RAM, thereby freeing the maximum of 260K for music. Other ►

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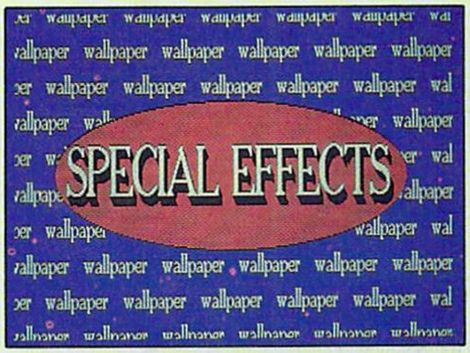
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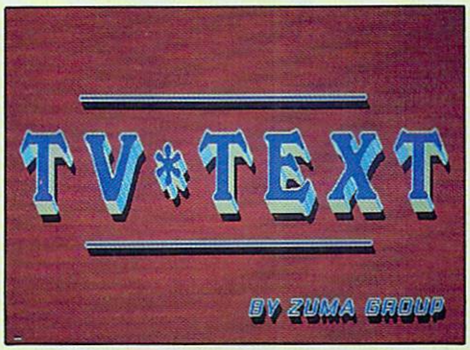
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RAM doesn't show because it isn't useable.

MIDI Chorus

DeluxeMusic sends MIDI data over all 16 channels using up to 128 presets each. An appropriately-equipped system can play chords of up to 36 notes (four Amiga and 32 MIDI) over a six-octave range (from C1 to C7). Amplitude commands control the dynamics with a velocity-sensitive keyboard. Should you find Amiga tunes texturally thin, adding a relatively inexpensive synthesizer like the Casio CZ-101 or Yamaha FB-01 expansion module (which has no "piano" keyboard) will provide you with a very respectable home MIDI studio. If you do this, try using the Amiga as a drum machine.

Even though the Amiga will only play four parts by itself, scores of over four parts are possible. DeluxeMusic lets you set the amplitude for every note and will play the loudest four notes of any chord. Failing that distinction, it will automatically play the single highest and three lowest notes. A total of eight instruments are available whether Amiga or MIDI, but I wish you could assign both types to one staff.

D.S. al fine

Although the manual is well-organized and has an index, it's a revision of the Macintosh version. Many features are undocumented including playing Amiga and MIDI music together, using fonts and disk operations. For the most part, these and other details are covered in the addenda. DeluxeMusic is copy-protected, but owners can purchase an unprotected disk to install on a hard drive. Although I don't have one, the people I've talked with who do say it functions nicely.

Electronic Arts will not automatically provide the upgrade disk and addenda to registered owners. Steve Peterson, Electronic Arts' DeluxeMusic project manager says that users having problems should complain to their customer service department at 415/571-ARTS. "They will be asked to mail in their original disk as proof-of-purchase," he explained, "And will be provided with the upgrade and additional documentation at no cost."

DeluxeMusic's strong points are accurate notation, flexibility and ease of use and MIDI-compatibility. I found it delightful to work with. Although it won't teach you music and it isn't perfect, DeluxeMusic is a fine program. It *was* worth the wait. At last we can quit reading about it and start making music. ■

Peggy Herrington writes regularly for AmigaWorld *and other microcomputer publications and specializes in the areas of music and telecommunications. Write to her c/o* AmigaWorld *Editorial.*

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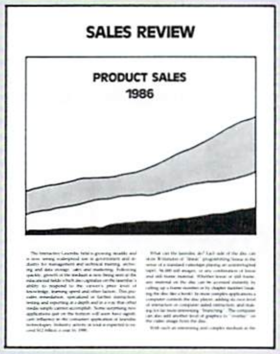
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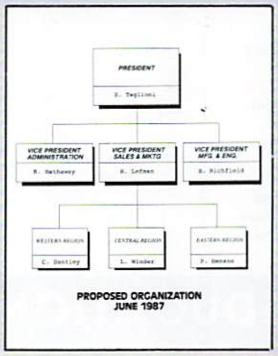
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SUZANNE CIANI

MAKING MUSIC THAT SELLS



You may not know her name, but if you have been exposed to radio or television even sporadically in the past 10 years (and who hasn't?), you *have* heard her sounds. After all, Suzanne Ciani isn't called the Jingle Genius for nothing. Her credits would fill at least a couple of magazine pages in small print. They include tunes, sound-effects and audio enhancements for the likes of Pepsi and Coca Cola, Lincoln/Mercury, Merrill Lynch and Energizer batteries.

Suzanne Ciani has been so successful in the advertising jingle business that last year her company, Ciani/Musica Inc., built a state-of-the-art $600,000 recording studio in the heart of New York City. It is available to outsiders by referral only, and since it's a beta-testing site for a number of equipment manufacturers, it offers everything you ever heard of in the way of digital music-makers including a Synclavier and, of course, an Amiga. "We've had an Amiga since last fall," Ciani told me when I interviewed her earlier this year, "And I think it has enormous potential—it looks real good." So good, in fact, that at the time of the interview, she was intensely involved in composing music for a series of live performances for which the Amiga will be the central controlling device.

Most of those performances have past, but on July 25th, Ciani will present a full-length solo concert at The Poly Technic Fine Arts Center in San Luis Obispo, California, for the Summer Arts Institute, along with a lecture on electronic synthesis. She will also be using the Amiga on a September concert tour of Israel in conjunction with Potenza's *The Peaceable Realm*, a 300-foot biblical canvas.

Ciani and her staff designed her Amiga MIDI-performance system to be easily transportable and therefore as compact as possible. "We're using eight rack-mounted Yamaha TX816 expansion modules," she said. (These are programmable synthesizers without piano-type keyboards, which are unnecessary under computer control.) "Each module has its own TX90 processor, and I'll be playing live on a Roland digital piano and a Super JX," she explained. Ciani will program, control and coordinate sounds from these digital instruments using the Amiga with Magnetic Music's MIDI software, Texture. She doesn't plan to use Amiga-generated sound.

In addition to her success in the advertising industry, Ciani is involved with video imagery and she released two music videos last November. She has written a good deal of original music, some of which is available on the RCA/Red Seal Skylark label. Her latest release is *The Velocity Of Love* which is a collection of 12 very expressive, subtle compositions. I find it hard to believe that such lush, romantic music was created by this compact, elfin woman using only steel and silicon. She actually became involved with electronic circuit design while creating the synthetic voice for Bally's electronic pinball machine "Xenon" and although she has a classical music background, says that making music is the only reason she is involved with technology. The list of equipment in her new studio reads like a MIDI buyer's guide and there isn't a traditional music instrument anywhere in the entire facility.

Ciani is planning to concentrate on music composition and performance in the immediate future, which was her goal before she was sidetracked into commercial music for, she admits, commercial reasons. (While in college, she became enamored of electronic synthesis when she went to work for Donald Buchla, a pioneer in the industry, but couldn't make enough money performing to afford the equipment she wanted.) She is presently negotiating with a new recording company and hopes to have several Compact Discs and LPs on the market soon. Although she couldn't make any projections, she is hopeful that they will make her Amiga performances available. □

—Peggy Herrington

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The happy story of The Little Music Program Who Finally Did.

By Ben and Jean Means

Not too far away in the not so long ago, Everyware and Commodore conceived a smart little music program called Musicraft. Sadly, Musicraft never saw the light of a computer store software display. But somehow thousands of buggy copies found their way to Amiga owners, who had been eagerly awaiting the melodious program. In defiance of its pre-release demise, Musicraft song scores and synthesizer patches soon appeared on electronic bulletin boards and filled many a happy computer home with music. And that's not the end of the story.

Happily, Aegis Development has gallantly rescued Musicraft from software oblivion by purchasing the program's world-wide rights. Redubbed Sonix, this new version of an old program has been thoroughly debugged by programmer Mark Riley and expanded with some nifty features. Those of you who have the old Musicraft will be glad to know that Sonix will play your old scores and synth patches. Best of all, it won't drive you buggy with Guru Meditations like Musicraft did.

Sonix has three basic parts: the Synthesizer, Score and Keyboard Screens. The Synthesizer Screen lets you create custom designed sounds with analog-style controls. The Score Screen lets you write music on a Grand Staff in traditional music notation. The Keyboard Screen turns your Amiga into a musical keyboard that can assign a six-octave range of notes to almost any keys on your QWERTY keyboard. ►

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With just a flick of your mouse-driven wand, your Amiga becomes a musical instrument—a four-voice, fully-programmable synthesizer that digitally emulates an analog synthesizer. And unlike most computer-music programs, Sonix sounds warm, not thin and cheap.

Analog synthesizers like the Minimoog and the Prophet Five are noted for their rich, full sound. Most digital synthesizers like the Yamaha DX7 are very crisp, but can sound tinny if you aren't an experienced patch programmer. Although Sonix has an all-digital synthesizer, it avoids this thin sound by clever programming that brainwashes its synthesizer into thinking analog.

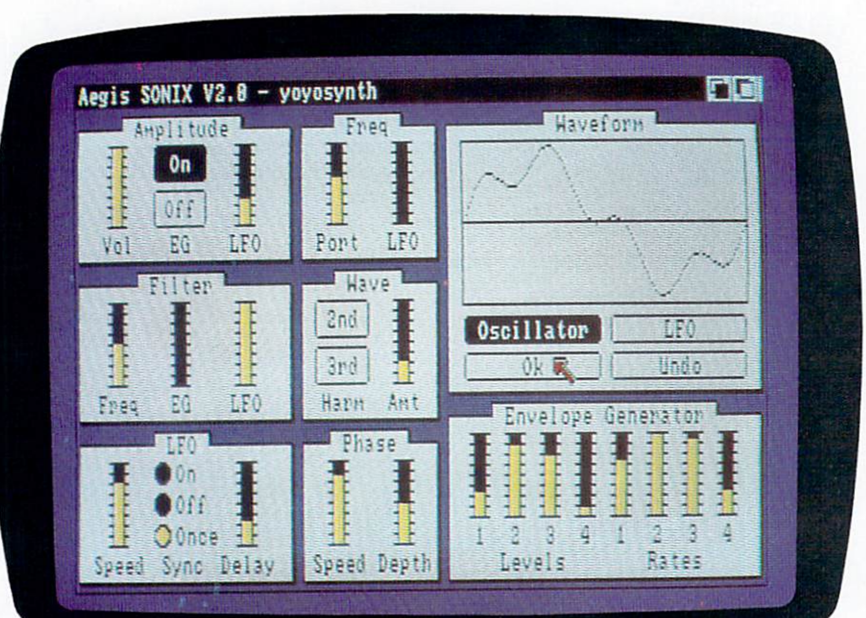
Sonix is a good passageway into the mystical world of synthesizers and the inner mysteries of patch programming. Whether you understand synthesis or not, you can create lots of fun sounds just by fiddling around with the sliders. Or you can become a proficient patch programmer following the manual's detailed instructions. You learn to develop your own sounds by using an oscillator, a filter, an amplifier, a harmonic generator, an envelope generator and a phase shifter. With a few deft movements of sliders, you can turn the sound of Tibetan bells into Muttering Martians.

If that's not enough, you can change the actual shape of the sound in the Waveform Display Window. For a really novel effect, you can draw sounds from scratch, sounds never before heard by the human ear, sounds that will amuse . . . and sounds that may leave friends and neighbors wondering about your state of mental health.

Sonix comes with some intriguing sounds like "India synth," "Ice Bells 2," "Atlantis," "The Pleiades," "Himalayas," "Banjo synth," "Koto" and "Acoustic Guitar."

The Synth window also has several features not normally found in analog synthesizers. Here beats the digital heart of the beast. The envelope generator is of the four-rate, four-level type pioneered by Yamaha's FM digital DX7. This envelope generator is superior to the traditional analog ADSR, which provides only three rates and two levels.

Sonix synthesizer screen.



Sonix can also play back sampled sounds, if they are in the IFF format. You can then modify the sounds by applying the envelope generator and vibrato. Aegis plans to offer a future version that will be able to use the entire synth window to modify sampled sounds. Known as resynthesis, this powerful technique previously was available only on digital-sampling synths costing thousands.

Compose Yourself

In the Score Window, you can compose music in traditional notation, then create your own Amiga symphony. You pick up notes and rests with your mouse from a display showing notes and rests of different lengths and place them onto the Grand Staff. You can enter four melodies and give them each a different sampled or synthesized sound. You can change your sounds at any time to add variety to the score. For example, the clavichord in a J.S. Bach piece could become a vibraharp or a Minimoog synth. Or, add some marimbas, and see what you get.

Music for Gongs and Whales

With a MIDI interface, you can add up to four more melodies for MIDI output to external devices, giving you an eight-piece band, all conducted by the Amiga. The Amiga could play Tibetan bells, claves, Chinese gongs and synth whales, for example, while running an external device playing the traditional drums, organ, bass and guitar from your score. Or, MIDI instruments can play all eight lines, if you don't want to use Amiga sounds.

Once melodies are entered in your score, you can edit, copy and delete them singly or in groups. You can also choose the key and time signatures for each score you compose. The only limit to a score's length is available memory. For simple scores using Sonix synthesizer sounds, 512K is adequate; for large pieces using many sampled sounds, you'll need expansion RAM. Scores are stored in IFF SMUS format so they can be used in any compatible music program.

The Score Window gives you your own little composition studio. During playback, you edit a score's volume, tempo, transposition and tuning with separate sliders. To set the volume of each track individually, use the Mixdown feature. You can further alter the playback of external MIDI tracks in the MIDI patch mode. And with the Amiga's multitasking power, Sonix will play your latest piece, along with your latest video, if you have extra RAM.

The Sonix Score Window lacks a lot of the refinements of professional scoring software like DeluxeMusic Construction Set by Electronic Arts. DeluxeMusic is only a music notation system (but what a music notation system!), while Sonix is mainly a synthesizer program. But Sonix's music notation is quite adequate for the home hobbyist and provides enough power for most budding composers.

Notes on Composition

Composing music on any notation program is a time- ►

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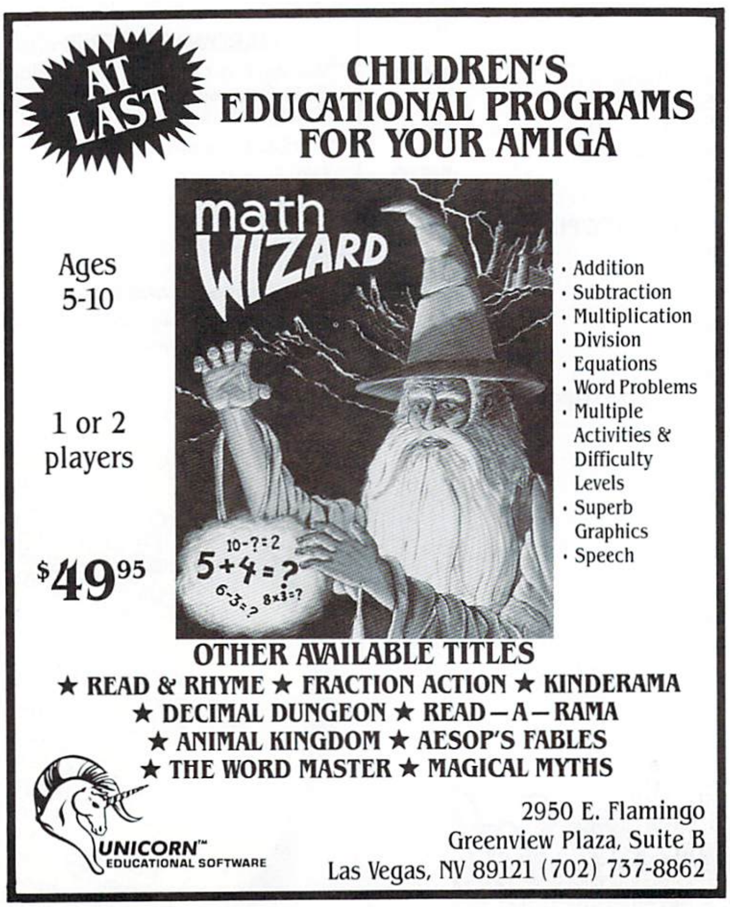
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consuming affair, but with Sonix, which is logically laid out, it is relatively painless. The number and distance of mouse movements necessary are mercifully few and short for the most part.

Composing in real time on a performance-oriented sequencer can be much quicker, but the big if in this equation is your performance ability. If you're not a very good keyboardist, notation software might be your best choice for composing. It allows you to write precise, accurate music that plays back perfectly.

Even if you don't read music now, using a notation program can teach you to read more quickly and easily. Best of all, you can print out sheet music to hand to any musicians you want to have perform your songs.

Jam on Your QWERTY

The Keyboard Window shows the Amiga's QWERTY keyboard and just below it a piano keyboard so you can customize which keys on your QWERTY keyboard play which notes from your synthesizer over a six-octave range. You select the Amiga key you want to assign a note to, then select the note from the piano keyboard. You can optimize the keyboard for any kind of scale, melody or chord you want to play, and save a different custom keyboard layout with each score. Riffs that would be difficult if not impossible on a piano can be played as easily as drumming your fingers on your Amiga keyboard. If you have a score that uses less than four Amiga voices, you can jam over the score on the keyboard with the voices not being used.

A Place to Begin

If you're new to music notation and sound synthesis, Sonix is a good place to begin. The screen layouts are concise and the commands are simple. And Sonix is easy to learn and fun to use.

If you demand an awesome sounding pro-synthesizer, your choices start in the hundreds of dollars and extend into the thousands. But before you make that kind of financial commitment, consider Sonix. You get a great sounding little synthesizer (especially when you hook it up to a stereo system), a music notation editor and a custom real-time keyboard. It's a wonderful music program that, but for Aegis, might not have been. Sonix comes with a 244-page manual that is a music education in itself and a data disk of great sounds and jazzy scores that will spark your own creativity.

And they all lived noisily ever after. ■

Write to Ben and Jean Means c/o AmigaWorld *editorial, 80 Elm St., Peterborough, NH 03458.*

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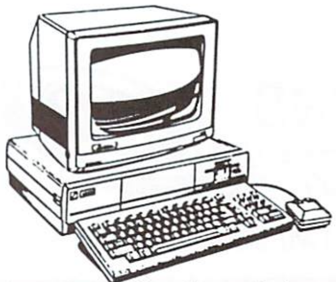
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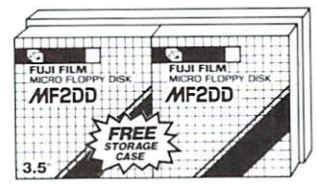
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User Groups Extraordinaire

The divergent styles of FAUG and AMuse could give you ideas for your local users group.

By Peggy Herrington

IF YOU ARE part of a group of Amiga aficionados, making the most of your group will come from capitalizing on its individual and collective strengths. FAUG, the First Amiga Users Group located in the heart of California's silicon valley, and AMuse, another high-profile bunch of AMiga USErs from New York City, are good examples of people who are using their local strengths and talents to advantage.

Out of the FAUG

Organized in 1985 before the Amiga was even widely available, FAUG's success has been closely related to the fact that its founders (Tim Avery, Kayvan Pejooh and Paul Montgomery) have tapped into the advantages of their geographical location. (Hint: Their first paid member was Jay Miner, designer of the Amiga's multitasking environment and former general manager of Amiga, Los Gatos, which is just down the road a piece.) Their meetings are devoted to demonstrations of new products and their list of speakers reads like an Amiga buyer's guide: Aegis, Activision, Byte by Byte, C Ltd., Electronic Arts, NewTek, Mimetics, and on and on. It's not unusual for 600 people to attend FAUG meetings, which are held on the first Tuesday evening of each month at the Hyatt Hotel in Palo Alto.

FAUG uses another of its strengths, the fact that Kayvan is in the printing business, to produce *Robo City News*, a slick, full-color newsletter with articles, photos, reviews and industry news that's mailed to subscribers all over the world and available in many retail outlets. They sponsor a very busy electronic bulletin-board system open to all callers (415/595-2479). They also have a public-domain program library that is augmented by their own "Hot Mix Disks," a compilation of commercial product demonstrations and new software garnered from Amiga programmers and product developers. Hot Mix Disks are available to members for $4 a disk and by mail to nonmembers for a modest additional fee. FAUG dues are $35 a year, which entitles you to 12 issues of *Robo City News*, and access to the disk library. Dues are used to cover expenses since the casual administrative structure is closely held by FAUG founders.

Easily AMused

By contrast, AMuse of New York City is a legal entity unto itself since it is a nonprofit corporation governed by an executive committee of annually-elected officers. They have loose affiliations with several other Amiga groups in the general vicinity and a branch club known as AMuse of West Chester (Pennsylvania, that is, which, of course, is where Commodore is located). The group publishes a bimonthly newsletter that is free and widely available in retail outlets; it has a public-domain disk library and sponsors an open FIDO BBS (212/269-4879); these three activities have become traditional user group features. Membership is $15 a year and meetings are held twice monthly (on first and third Tuesdays) at the School of Visual Arts in Manhattan (which they are rapidly outgrowing since attendance sometimes surpasses the 200 mark, and seating is for 160). Like FAUG, AMuse often hosts demonstrations by commercial developers, but, unlike FAUG, they have several special-interest groups that meet at other times.

AMuse is stepping away from user group tradition, however, by sponsoring a series of nationally-oriented Amiga expositions, an ambitious undertaking when you consider that AMuse officers all have full-time jobs elsewhere. Wisely, they have engaged the services of a professional convention and seminar service to help organize and manage these shows. The first AmiExpo will debut this fall, October 10 through 12, 1987, at the Sheraton Centre Hotel in New York City. From their list of seminars and speakers, presentations on many exciting vertical-market applications are planned and many notables from the Amiga community are planning to participate in what looks to be a first-rate affair.

A second AmiExpo is scheduled for early next year (January 22–24, 1988) at the Los Angeles Airport Hilton, and a third at the Hyatt Regency Hotel in Chicago on July 22–24, 1988. All three shows will be open to the public for an admittance fee and interested exhibitors can call 800/32A-MIGA toll free (212/867-4663 in New York) for more information.

YourTown, USA

The divergent styles of organization FAUG and AMuse have chosen could give you ideas for your local group. While the activities these groups enjoy may be beyond the scope of your local group's resources, don't be afraid to use the contacts and assets available on your own home turf. Amiga developers that aren't too far away are often delighted to make presentations at meetings if they're invited, as are local retailers. Getting together is one of the best ways to share ideas, news and discoveries, to find help with problems and to learn about and try out new software. If you're not in an Amiga user group, you might enjoy visiting one; if you can't find a group near you, maybe you should start one! ■

Peggy Herrington is a Contributing Editor to AmigaWorld. *Write to her at 1032 Forrester St. NW, Albuquerque, NM 87012.*

Help Key

Confounded by the utter complexity and profound mystery and power of his Amiga, Earl wisely directed his trembling finger toward . . . the Help Key.

By Bob Ryan

Snap Windows

Q: I use subdirectories to keep my Textcraft documents organized, and I use the Snapshot option to organize windows the way I want. What I can't do, however, is change the size and location of the window that appears when I open a directory drawer. How do I get windows to open where I want them?

Duane F. Martin
Monterey Park, CA

A: Changing the default size and location of directory windows is very similar to changing the default location of document icons. First, open the window you want to change by double-clicking on its drawer. Next, move and size the window to the place and dimensions you want. Finally, select the drawer icon with a single click and choose Snapshot from the Special Menu. Your window will now open at the location and size you specified.

A1000 ROM

Q: From reading your March/April '87 story on the Amiga 2000, I learned that the Amiga 2000 has Kickstart in ROM on a daughterboard. I wonder if I can insert Kickstart ROM chips in my Amiga 1000? Do you know where I can buy Amiga ROM chips?

Also, I've been reading about the Sidecar for almost a year, but I don't know of any place that is selling it. I called the Amiga support line at Commodore (215/436-4200), but I never got through. Do you have any more information about Sidecar?

C. Graham-Cringley
Framingham, MA

A: You can buy a Kickstart Eliminator Kit for your Amiga 1000 from Creative Microsystems Inc., 10110 SW Nimbus #B1, Tigard, OR 97123, 503/684-9300 for $129.95. You'll have to install the ROM yourself—a tricky process. The Kickstart Eliminator comes with a disk that lets you add (using AddMem) the 256K RAM formerly used by Kickstart to your system as expansion RAM. I don't like using AddMem, because I don't want to have any memory conflicts with auto-config devices, so Kickstart Eliminator is not for me. (I also wonder about possible bus contention since the Writable Control Store is on the chip RAM side of the bus.) If you want to throw away your Kickstart disk, however, Kickstart Eliminator will do the trick.

I don't have any more information on Sidecar than you do. It was first promised last Fall, then by Christmas, then in the first quarter of '87. It's now April 13 and you can't buy one in the U.S. I shouldn't be surprised anymore when Commodore promises a product then fails to deliver, but I am. And I understand your problems with the Amiga support line; I get calls almost daily from readers who are tired of trying to get through. Commodore needs more people to handle user's questions. I just hope that Commodore shows more interest in listening to customer problems, since current owners are the best Amiga salespeople. If they fail to support their current owners, they may not get many new ones.

Hertz So Bad

Q: In AmigaWorld*'s review of sound digitizers for the Amiga (January/February '87, p. 29) it is implied that the Amiga can output sounds of frequencies up to 15KHz. I remember reading somewhere when the Amiga first came out that the machine couldn't produce sounds above 7KHz. I've never seen this issue addressed in any publication. What's the straight story?*

Karl Keys
San Francisco, CA

A: According to page 156 of the *Amiga Hardware Reference Manual*, the low-pass filter that eliminates aliasing distortion cuts off signals above 7KHz. The Amiga can't use its internal sound hardware to generate signals above 7KHz. We apologize if the article seemed to imply otherwise.

Bus of Contention

Q: I recently read a message on a bulletin board system stating that the Amiga 500 is slower than the Amiga 1000. I thought the machines were essentially the same. Is the Amiga 500 a slowpoke?

Frank Rochette
Stonington, CT

A: The Amiga 500 has the same clock rate as the 1000 and shouldn't be any slower. What could be a problem is the A501 Memory Expansion that plugs into the underside of the 500. Unlike expansion memory that plugs into the side of your 1000 (memory that is only accessible by the Amiga's 68000 CPU), the memory on the A501 shares its bus (its data communication lines) with chip memory. When the Amiga custom chips access chip memory to handle sound or the video display, the 68000 can be shut out from accessing the A501. This is not a common occurrence, however, because the Amiga custom chips are designed to access the bus while the 68000 is working internally. The custom chips do have priority, however, so if you're running a heavy graphics application, such as one using five bit-planes, the custom chips will take over the machine for entire cycles and not just the parts of cycles not used by the 68000 for external access. As a result, programs running in A501 memory will run slower because the 68000 can't access the memory to fetch the next instruction or to store a temporary result. To avoid this problem, you might want to forego buying the A501 board and expand the 500 via the expansion bus only. ■

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Reviews

Superbase Personal

More powerful than a file manager, able to leap tall graphics in a single bound, it's . . . Superbase!

By Al Willen

Superbase Personal gives the illusion of being simplistic. Quite on the contrary, Precision Software's relational database program—while easy to learn and use—is extremely powerful and complex. Database management systems are among the most complicated applications programs, so a certain degree of studying is required to get Superbase up-and-running. But Superbase is layered so even a novice can do simple things, like address files, in no time.

To the delight of non-typists, Superbase is almost completely Intuition driven by the mouse. The five pull-down menus (Project, Record, Process, Set and System) each offer dozens of subchoices. With them you can not only establish and customize your database, but create or expand subsequent file structures, and display or print your files in a variety of ways.

Constantly open and similar to a spreadsheet's work area, the resizeable Main Display Window allows you to manipulate any field's information. You move through the window with 12 control buttons similar to those on a videocassette recorder. By clicking on a button you can rewind the file to the first record, fast forward, fast backward, skip to the next record, go to the previous record and pause the display, among other things.

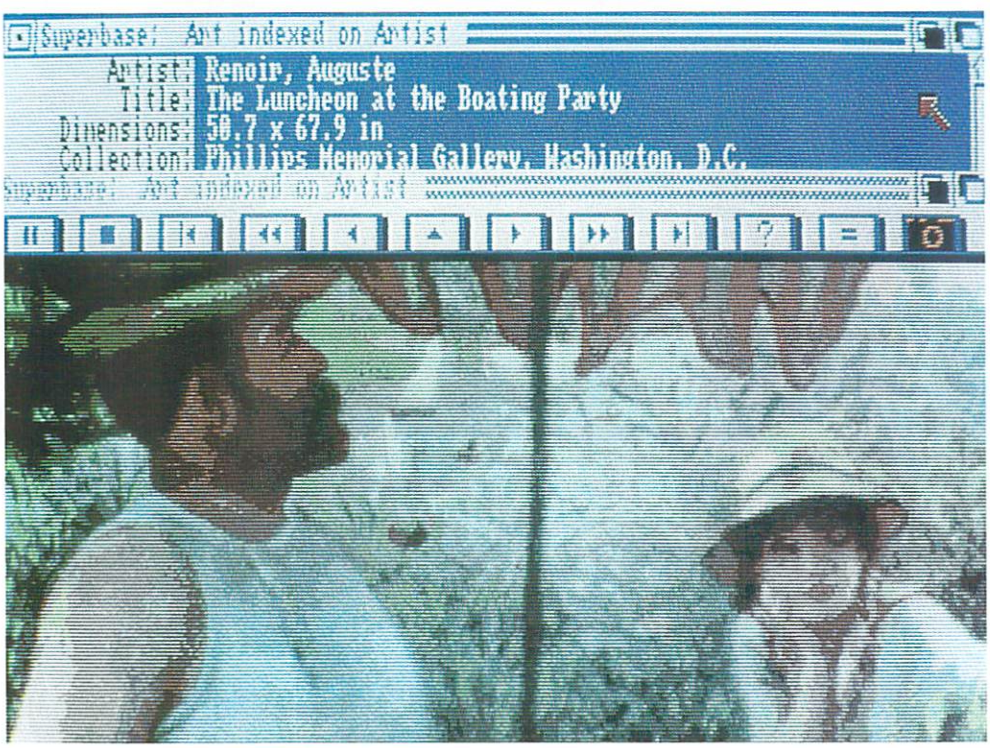
However, unlike a VCR, there are three specialized database buttons. The Key Lookup Button will retrieve a individual record or records based upon the current index and one user-defined criteria. The Filter Button lets you define a set of criteria that Superbase uses for record searching. The Filter Requester simply presents the file's various fields in a roll-down secondary window, along with a control panel consisting of numeric and Boolean choice gadgets. Besides searching through your file for specific records, this requester allows pattern matching and wildcards, as well as a case insensitive LIKE operator which will find a text string regardless of whether the individual characters are upper or lower case. The last Display Window button opens up a secondary graphics window for IFF picture files.

Diversity Not Difficulty

In the Project mode, you can create a new file or index, open a previously established file, field, index or query; edit a file's internal structure, save a file or query, remove (delete) a file or index and exit. For true inter-file relationships, Superbase can work on more than one open file at the same time.

File size and maximum field quantity are limited only by your machine's RAM and disk drive capacity. Superbase also allows the user to specify up to 999 indices per file. An index is a field, sometimes called a key field, from which a database program can use to sort a file. About three years ago, even the most powerful systems only offered one or two indices per file.

A query is a user-defined set of directions which forces Superbase to display files in a highly-formatted manner. Because query files can be saved, and retrieved later, a variety of different display formats can be se- ►



quentially evoked; perfect for hardcopy reports.

To create a new file, simply select New. A secondary window opens showing a viewing screen of newly created field names, their attributes, their format and any additional pertinent information. The New Field window is typical of Superbase's windows: powerful, but easy to use.

In a file of customers, for example, to create a new field in a file, type its name, Customer Number, in the name box. To indicate that the field's type, click the numeric button. The Number Requester offers a variety of ways to represent a simple number, from scientific notation to dollar signs and commas automatically inserted. Pressing the Required button forces the end-user to always supply a customer number for each new record. The Validation function lets you specify a range of acceptable values for entries within a field. To save a new field and related information press Add. In a similar fashion, you can establish Text (field lengths are defined), Date (for time/date coding of your records) and External fields (such as picture files which can be treated as fields within a record). The External fields meld graphics with textual data, so, for example, a real estate agent could store together a picture of a house and information about the house.

The last option on the Project control panel is a Calculation button which forces Superbase to automatically calculate a numeric field value based upon values contained in two or more previous fields in the file. Similar to techniques found in spreadsheet programs, the feature supports all numeric and Boolean operators, plus 29 built-in functions.

The Record Mode allows you to duplicate, create, edit, delete and save records. Unlike most features found in Superbase, this mode supports both mouse and keyboard selection of options (ie. Amiga Key + First Letter of Choice).

On Display

The third Menu option, Process, lets you manipulate files and fields. The Update command performs global changes on a file based on user-defined rules. The second option, the most powerful in the Superbase system, is Query which establishes if the file will be sent to the CRT, printer or disk, and how it will look. Using a Query control panel you indicate which fields will be shown, their order, what filters or search limitations will be used, how the index file will be sorted and what file calculations (record counts, average means of numerical fields, field sums and report/group categorizing) will be performed.

Other Process menu options remove files or fields, import or export ASCII files to and from Superbase, print address labels and direct output to the printer rather than the screen. The Labels option is the best I've seen and allows the user to fine tune the printing of address labels using a variety of different printers and paper label stocks, widths and sizes. There's even a test label button for easy set up.

Set mode contains a screen/printer toggle, a table/form/record view toggle, a paging on/off switch and various number, date and product customizing options. The programmers provided Superbase with a number of monetary symbols, date conventions, number formats and external file delimeters so that people worldwide can use the program.

The table/form/record view toggle allows you to display the records of a file with the field names and values in three different ways. Table View displays the field names horizontally in the first row, followed by many records scrolling downward. The Page On option pauses the output. Great for invoices, bills and other formatted documents, Form View allows you to graphically position, via the mouse, the various fields on the display screen. One record is shown per screen. Record View shows a single record with field names listed vertically in the left column.

The last menu mode, System, tells you about Superbase's system. A DOS option sorts and lists the current directory; changing drives and search paths is a snap. Status gives a complete synopsis of the currently opened file, including stats on all field names, field types, special field requirements, indices and whether they're unique or not. Like all Superbase outputs, this listing can be sent to your printer. Screen Dump directs all screen output, including picture files, to a supported graphics printer. System List shows any text files in your directory, while the System Reorganizer helps reclaim wasted disk space caused by frequent deletions from a saved file.

The Buggy and the Bizarre

Superbase is a fantastic program, well worth its price, but version 1.0 does have some problems. Because Superbase is predominately mouse driven, good typists may find the point and click input method tedious. Superbase can export ASCII files for sorted database reports, but these reports cannot be used in word processors, such as Textcraft. I tried linking an .info file with the exported ASCII file, but with no luck. However, the ASCII file can be read and altered with ED, from the CLI.

More oversights than flaws, there are a few additions I'd like to see in the next version. A global search command would be helpful, so you don't have to set up a query file to sequencially search for a specific value in each field of all records. Although Superbase's User Guide is excellent, there is no Help key for instant on-line assistance.

A more serious flaw is that a few options of Superbase will not operate correctly with some third-party brands of peripheral equipment. Obviously, since non-copy protected Superbase uses a hardware key, which plugs into the second port, other port devices will have to be temporaily removed. I also found that I had to remove several other pieces of parallel port peripheral equipment (FutureSound) from my system before Superbase would work correctly.

Superbase is the easiest, most user-friendly program for the Amiga that I've tested thus far. This coupled with Superbase's power and wonderful versatility make Superbase a must have addition to your Amiga library.

Superbase Personal
Progressive Peripherals and Software
464 Kalamath St.
Denver, CO 80204
303/825-4144
$149.95
512K required.

Texture

If you want professional quality, expect a professional price.

By Ben and Jean Means

Back when synthesizers were monophonic and MIDI was a skirt length, Roger Powell was already making music with computers. Synths and MIDI have come a long way, and so has Roger Powell with his professional MIDI sequencer, Texture 2.0.

Texture is a professional songwriting tool for professional musicians written by a professional musician. Roger's years of experience as a synthesist with Todd Rundgren's Utopia shaped the basic idea of Texture: to get quickly and easily from the bare bones of an idea to a full-blown song. ▶

Composing is not as easy as taking the disk out of the box and booting up, however. Before you start you'll have to buy a MIF-AMG adaptor ($125) and a Roland MPU-401 MIDI interface ($295, but graciously donated for this review by Whittaker Music of Long Beach, CA). Since the program doesn't use the Amiga's internal voices, you'll also need at least one MIDI synthesizer as a sound source and to input notes.

Utopian Composition

With Texture, translating your ideas into music is simple. Notes are recorded into Patterns, then Patterns are Linked together to create Songs. Each Pattern has 24 tracks to record on; this is like having a 24-track MIDI tape recorder to capture all your ideas, which can then be spliced together into a complete Song.

Texture lets you record 96 different patterns, each from one to 999 beats long. Since all of these 96 patterns are 24 tracks deep, you have a maximum of 2,304 independent sequences. This software sequencer offers all the recording features that higher priced hardware sequencers do, and it's easier to program. Carting your Amiga around for playback at live shows can be a little clunky, but software sequencers really shine in the studio.

Your raw tracks can be edited in a myriad of ways. Texture provides a Programmable Punch In and Punch Out function that allows you to fix small mistakes without rerecording a whole track. Tracks can be moved, transposed, mixed, muted and filtered. You can change the speed, loudness and articulation of any region of any track; then scale the changes to create precise values of ritardando or accelerando, crescendo or dimuendo and legato or staccato effects. The Copy function gives you cut-and-paste editing, word processor style, while the Fill function creates a loop of any length that can play throughout the pattern. Best of all, you can edit while the pattern is playing and reverse anything you don't like with the Undo command. So you can try out your wildest musical ideas without having to worry about losing the original track!

The Record Buffer lets you jam over a looping pattern, ever in search of the perfect take. When at last your fingers falter and your ears just can't stand another note, you invoke the buffer, which has faithfully stored all those precious takes. Now you can pick and choose the best of all of your brilliant ideas, and discard the rest to safe oblivion.

Want more flexibility? Then, you can skulk through the darkest recesses of the MIDI note jungle in the MIDI Event Editor, hacking away at the elusive wrong note. And you can insert, delete or change any MIDI events you choose.

Link mode is where you forge your song; here all those finely tuned patterns of Bridge, Verse and Chorus are assembled into a complete piece. Each of the 99 links has programmable repeat, tempo, transposition and track muting. Link mode is great for arranging since it lets you quickly try out different song structures.

Don't Play in the Dark

The video screen gives software sequencers their biggest advantage over hardware sequencers. Instead of peering into a small display where mystical numbers leave you pondering what you've really done by punching all those buttons, software sequencers give you a whole screen full of information.

Texture's screen has three areas displayed in bright colors. The left-hand side provides playback information such as tempo, beat number and track status, as well as a menu of commands. The right side of the screen changes from a track display in Pattern mode to a MIDI event list for step editing and finally to a map of pattern assignments in Link mode. The bottom of the screen contains the two menus of function keys used for Pattern and Link mode, as well as prompts for operations requiring more than one keystroke.

Everything is clearly laid out, so you can see exactly what you are doing, making Texture quick to learn and easy to use.

Tape sync gives you a precise timing command, which allows you to sequence multiple tracks onto a multi-track tape deck, so they will all play together. The Roland MPU-401 uses FSK tape sync to sequence these multiple overdubs exactly. So, if you have a four or eight track recorder, you can stack all of your synthesizers together on each overdub you record. With this method of recording, even a modest synthesizer setup can sound incredibly large.

No Mice Allowed

Texture was ported over to the Amiga from the IBM PC. As such, it doesn't use the Amiga's internal voices or make use of the mouse. But Texture's mnemonic commands soon become second nature. Record is "r," "p" is play, "e" is erase and so on. If you forget a commmand, the help screen will refresh your memory.

If you need more help, Texture's clear and concise manual fills in the details. The short start-up section is followed by an alphabetical list of all the program features. Each entry defines the feature, gives an example of how it can be used and hints.

Texture explodes the myth that powerful sequencers are hard to learn and strenuous to use. One of the best sequencers available, Texture is as easy to get along with as any piece of software I own. After only two days, I was using virtually every part of the program and wondering how I'd ever written music without it. Texture even defeats writer's block; you can discover whole new grooves and go where you've never musically gone before with all the buffers, loops and high-powered editing.

Texture is not cheap at $715, including the interfaces, but you get what you pay for and more. If you need a fast, friendly songwriting tool, Texture is hard to beat.

Encore, Roger, encore.

Texture
Magnetic Music
RD #1
North Smith Rd.
LaGrangeville, NY 12540
914/677-8586
$295
512K required.

B.E.S.T. Business Management

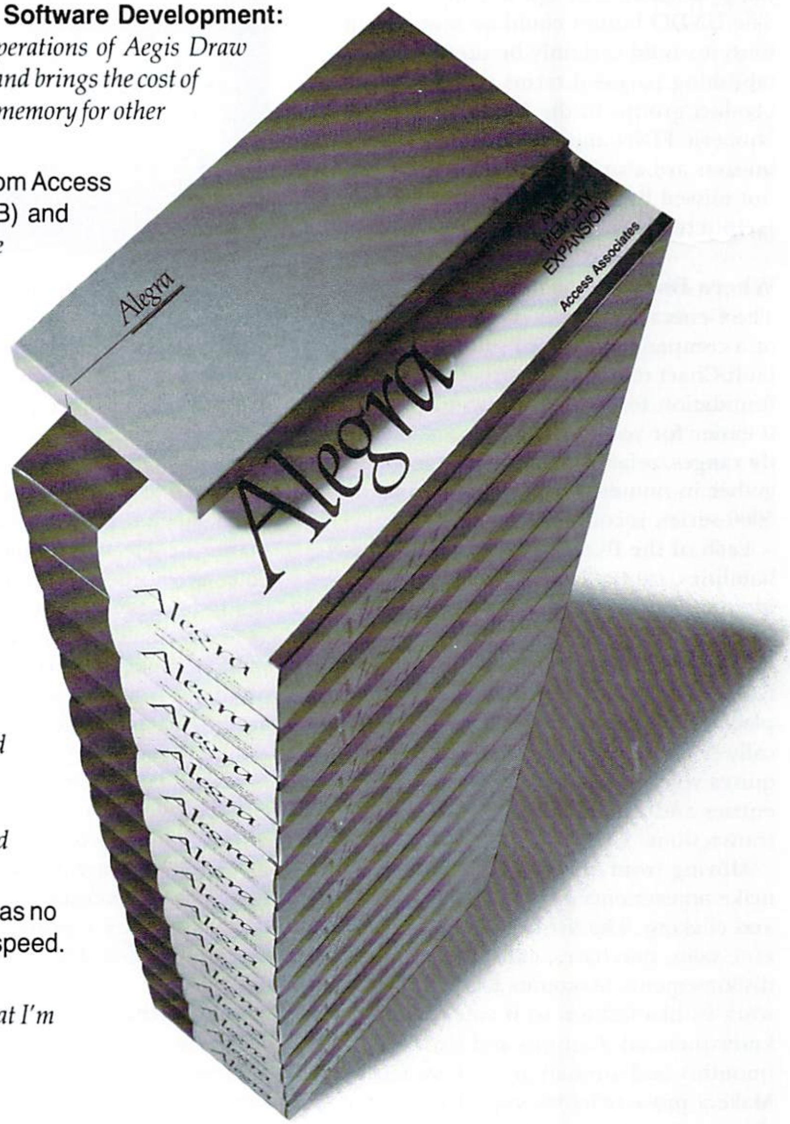
Put away your beans, the Amiga can do all your counting for you.

By Ted Salamone

Any (legal) business needs to keep financial records, track merchandise and channel their flood of funds to the proper accounts. A seamlessly integrated system, B.E.S.T. Business Management handles Accounts Receivable, Accounts Payable, General Ledger, Inventory Control, Service Control, Order Entry, Invoicing, Purchasing and Point of Sale. The multi-module, extremely flexible Report Writer will fill even the largest corporate briefcase with logically formatted journals, audit trails, invoices and purchase orders.

Everything is tied together neatly with exceptionally high-quality documentation and ▶

Reasons to add Alegra are stacking up.



■ **Bill Volk, Aegis Corporation, Vice President Software Development:**
"The Alegra is an excellent value and speeds up operations of Aegis Draw substantially. It works well with 1.2 operating systems and brings the cost of memory expansion for the Amiga in line with the cost of memory for other computers."

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Economically priced and highly reliable, Alegra has no wait-states, so your Amiga operates at its intended speed.

■ **Bruce Webster, Byte, Consulting Editor:**
"...it's worth the price for the added power. I know that I'm hooked."

Available at your quality Amiga dealer.

ACCESS ASSOCIATES

491 Aldo Avenue, Santa Clara, CA 95054-2303 (408) 727-8520 FAX 408-727-0792

Circle 54 on Reader Service card.

customer support. Don't worry if you're not an accountant or techie, the manual's appendices include a succinct dictionary of business and accounting terms plus descriptions of data-entry keys and program gadgets.

System startup is easy. Copy the unprotected program disk and follow the instructions for a machine with one floppy, two floppies or one or two floppies and a hard drive. There are even directions for converting the system to different hardware configurations.

The first screen you'll see is a flowchart depicting the system modules and their interrelationships. Throughout the modules there are commonalities. Gadgets include line/item delete or insert, advance to next, prior, first or last record in a database and jump to the first or last line of a report. The UNDO button could be more ubiquitous; it would certainly be useful when establishing payment terms or setting up product groups in the Inventory module. Numeric FIND and alphabetic SEARCH buttons are also included. Conspicuous, but not missed by their absence, are online Help screens.

Where Does the Money Go?

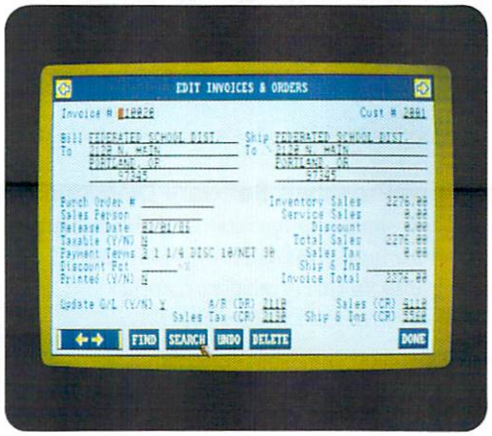
The General Ledger is considered the heart of a company's financial system. The default Chart of Accounts provides a good foundation for building your own. To make it easier for you to create reports and specify ranges, related accounts are grouped together in numeric ranges; assets runs in the 1000 series, income runs in the 4000s.

Each of the five major categories—assets, liabilities, capital, expenses and income—is identified by its normal default balance, either debit or credit. This is important for non-accounting types, especially since B.E.S.T. is not a one-write system where you place one entry and the system automatically posts its opposite. The program requires you to balance debit and credit entries and will not accept unbalanced transactions.

Moving from one journal to another to make adjustments is a matter of pointing and clicking. The list is comprehensive, general, sales, purchases, cash receipts and cash disbursements (Accounts Payable). They work in like fashion so if you know one you know them all. Postings and closings (monthly and annual) are well structured. Make a pre-activity backup of your data, then proceed via menu option.

Except for unique categories, such as creating the customer database, payment terms and statement messages, Accounts Receivable operates similarly. Working from a database of customer information you can create charges, note payments, set account limits and check on the status of accounts. Accounts Receivable also handles interest, taxes and delinquent assessments.

You can define up to nine unique payment terms for the system and assign customer defaults that can be overridden when invoicing. Discount percentage, discount days, net days, late fee percentage and a descriptive field make up the entire process.



For past due accounts, the system permits four sets of messages on monthly statements for the ranges: one to 30 days, 31 to 60, 61 to 90 and 91 plus. The customer record is a bit cramped, providing only three lines for a name, company name and address.

On the processing side, for accounts with the balance forwarded, aging is simply a matter of selecting a menu option. Open invoice accounts are automatically aged by the system. Some systems costing five times as much don't handle this dichotomy as well. Housekeeping chores such as purging old records and clearing to-date totals are also menu driven. You'll be pleased with the available reports.

Accounts Payable is analogous to Accounts Receivable, except for the direction of the monetary flow. Accounts Payable has a vendor database, but otherwise the likenesses are numerous—aging reports, account summary reports, housekeeping chores, payment terms and mailing labels.

Stocking the Electronic Shelves

Some businesses carry merchandise, hence they need to know how much they have, how much it costs, who supplied it, how much it sells for and how well it has been selling. Inventory Control handles all the details. You can define an item master database that stores information about goods and product groups (electronics, housewares, etc.). The only shortfalls in the item database are the lack of alternate vendor and substitute item fields, which make purchasing easier and sales more lucrative. Of course, you can get around this through creative product grouping and item numbering.

Service Control tracks service calls (repairmen), hours expended (professional services) and pricing. Services and service groups are entered just as goods are in Inventory Control.

Pay Up

Purchase Orders are done in two parts; the first records supplier and ship-to information along with payment, terms and tax info. A separate screen permits item entry by part number, description, cost and quantity. The system automatically updates total cost as other factors are changed. Once placed, Purchase Orders are posted to denote an item's on-order quantity and status.

The Receiving module has two functions: Receive Invoices and Receive Bills. The former takes information from goods received, notifies inventory of their arrival and tells Accounts Payable that a bill is due.

For paying those bills, Check Writer makes it easy to create, edit, print and then post check transactions. Checks may be entered in advance of their due date, edited to reflect payment changes and then output at will. Users can elect, on an individual check basis, whether or not the check is to affect General Ledger balances. The system is flexible enough to handle payments for goods purchased with or without invoices and purchase orders. It can also handle C.O.D. shipments and other unexpected payment needs. When outputting hardcopy you can specify a range of checks to limit the number actually run, so other advance checks are left within the system.

Invoicing and Order Processing are inseparable. A customer database is maintained (the same one as in Accounts Receivable); orders are placed against this record and your item master. The order processing screens look and act like the screens used to place a purchase order. Until orders are actually updated they are just memos on the system, not affecting Accounts Receivable or Inventory Control. Once updated the system will reflect the new unit and dollar balances.

On the invoicing side, hardcopy is output via two ranges, invoice number and customer number. When printed, invoices are ▶

ready to be posted. When posted, the transactions alter General Ledger, Accounts Receivable, Inventory Control and Service Control balances.

The Ring of the Register

Retail concerns can make use of a specialized order-processing option entitled Point of Sale. It handles orders in the traditional retail storefront manner. Invoices, with sales, tax, discount and related information, are used to note and control a transaction. As each invoice is made you have immediate print capability—ideal for over-the-counter sales.

For money coming through the mail rather than over the counter, the B.E.S.T. system allows you to post payments to individual invoices if the remittance advice is complete. If not, payments will be automatically posted to the oldest (customer) invoice first. Funds are applied until exhausted, sometimes resulting in partial payment of some invoices or resulting in a credit (payment on account). As in Accounts Payable, individual transactions can be added to or omitted from the General Ledger.

Boy, is this system complete. Instead of forcing you to adjust journals through reverse entries to accommodate returned goods, the system automatically adjusts through menu options. Both cash and credit sales returns are handled—almost the same way as placing an order. Both inventory and services can be adjusted through their own submenus. The key to this approach is that the proper sales, Accounts Receivable and General Ledger accounts are updated as the entry is processed. On the flip side, there is adequate provision for return of purchased goods.

The Bottom Line

You can get around a wide variety of apparent obstacles in this application with some ingenuity. For instance, B.E.S.T. provides for only one tax rate, making the system difficult to use in areas where the city, county and state all take a share of a sale. But, by properly designating service groups according to different tax rates you can circumvent the problem. Also, the program only handles one company or company division, so if you have to track subsidiaries or related firms you'll need multiple systems. However, the software is targeted for small businesses, not multinational conglomerates.

The B.E.S.T. Business Management system is an excellent piece of Amiga business software. It is as thoroughly designed and executed as their other products. When I close my books for Fiscal Year 1986, I plan to move the records into B.E.S.T.

B.E.S.T. Business Management
B.E.S.T. Inc.
PO Box 230519
Tigard, OR 97223
800/368-BEST
$395
512K required.

Musical Accessories

What do a box of chocolates and the Amiga have in common?

By Peggy Herrington

Remember Whitman's Samplers, those yellow boxes of assorted chocolates? That's how I think of a disk of sampled sounds, filled with tasty chunks of good things. All the music composition programs reviewed here use sampled sounds as instrumental voices, digitized recordings of audible real-world events. Samples can be used as sound effects, too, since you can digitize anything audible and play it back over a single Amiga sound channel. Although you can record your own samples, it isn't easy. Getting good samples requires decent audio equipment and a fair amount of knowledge and editing skill, not to mention luck. Most electronic musicians and programmers buy libraries of them on disk.

But how do you choose from the symphony of samples available? I tested the following selection of disks, almost 500 individual sounds, with DeluxeMusic Construction Set, Instant Music, Sonix and SoundScape, and used many of the sound effects in DeluxeVideo. Incompatibilities were few. Most were attributable to file-naming conventions (correctable by renaming them) and size limitations within Instant Music. Many samples cover only an octave or two in range, and some play an octave lower than they were recorded, both of which can throw off the characteristic sound of an instrument when adjusted. They will play, but if aural accuracy is a consideration, contact the developer about using their samples with a specific music program before you buy. None of the disks are copy-protected, but all of the sounds themselves are copyrighted and may not be distributed without permission.

Sampling the Samples

I.M. Instruments is an assortment of 31 acoustic music-makers: six guitars, three drums, 19 various winds, strings and bells and three sound effects. Most cover six octaves and are of good quality. There's a nice harp glissando, but the loop point is audible in a few, notably OrganChord. Sounds are arranged in directories and each has an icon; many are IFF translations of sounds from an early Amiga dealer demo disk. Overall, this is a handy collection and it's certainly a nice alternative to instruments provided with the composition programs.

Sound Advice samples by Waveform Technologies are in file formats tailored for specific music programs. If you don't match music programs and samples, they won't work. Those for SoundScape, for example, will crash DeluxeMusic, although you can resave them in IFF format. Waveform offers over 30 samples per disk, even including synthesized sounds for Music Studio. A number of samples use ring modulation (temple blocks, bells, xylophone, etc.) and most make very interesting instruments, enhanced so thoroughly that I doubt they bear much resemblance to the original. Nice, fat sounds here.

E.C.T. SampleWare's collections are available in either IFF or Mimetics' file-format. The 17 samples on the Orchestral disk, like the others, are done exceedingly well. Orchestral Hit, for example, is a multi-instrument Stravinsky-type chord. Many of the acoustic instruments are crisp yet subtle: viola, English horn and tympani, to name a few. The Rock disk has 18 guitar, electronic drum and synth sounds. For building really thick musical textures, the Rock disk offers major and minor chords using only one sound channel each. The Grab Bag disk has 26 wild and crazy samples, many of which were used in the film *One Crazy Summer*—they are fun to play both musically and for effects.

Speaking of sound effects, **Karl Denton**'s six-disk collection has a whopping 290 files in compact IFF DeluxeVideo format. They perform with music composition programs, too, but while they can relieve tedium, most of them aren't very appropriate. Cars, planes, guns, babies, creaks, screams, groans, whines, crowds, lawnmowers, mixers, water gurgles, splashes, animals, just about everything you can imagine was faithfully recorded. Game and video program- ▶

Finally News

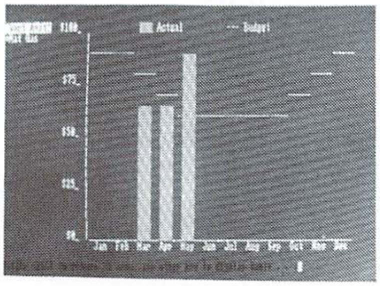
News and Information on Products from Finally Software



The Doctor Is In

Shown above, **Dr. Xes™** is a psychotherapeutic game which uses artificial intelligence techniques and speech synthesis to converse with you on topics involving your well being and mental health. More fun than a padded cell and great for parties !

Financial Favorite

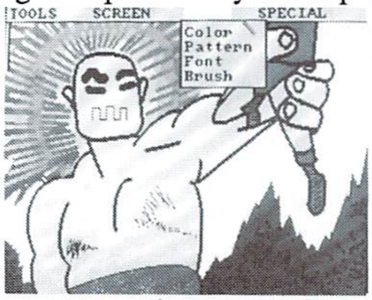


Hundreds of people across the country are using **PHASAR: The Financial Manager™** on their Amiga computers to organize their finances. Lauded as the "hands down favorite" by AmigaWorld, this program is helping people worldwide, and has rapidly become the leader in financial programs for the Amiga. It lets you sort out your finances by providing accurate tracking of multiple accounts; cash, credit, savings, payroll, deductions, medical expenses, utilities, etc. It also helps in tax preparation and prediction. PHASAR has built in intelligence which minimizes typing for quicker entry of information and transactions. It comes complete with a 100+ page manual and on-line help which shows all features and how to use them. Available now for only $99.95.

Watch for **ComicWare™**: The audio animated Comic Book series. Coming soon from Finally Software.

Graphics For Less

Finally software just announced the recent acquisition of B-Graphics™ from Rastaware. Finally will reintroduce the program as **B-Paint™**. This program lets you draw with low, medium or high resolution on any Amiga computer. Easy-to-use pull-



down menus give you tools to draw simple or complex images, and it reads, stores, and prints IFF files allowing you to use pictures created with other standard Amiga drawing programs as well. Best of all, the source code is included. At a price of only $39.95, this represents one of the best values available for the Amiga computer.

Motion Commotion

Finally software is proud to announce **AmigaMotion™**, the latest in animation software for the Amiga. This frame animation software is the first of its kind. It allows you to use sources such as B-Paint™, Deluxe Paint™, or Digiview™ to create animated sequences. Sequences can be edited then played back on your computer or stored to any VCR for feature length animation. Available now for only $99.95.

FINALY SOFTWARE

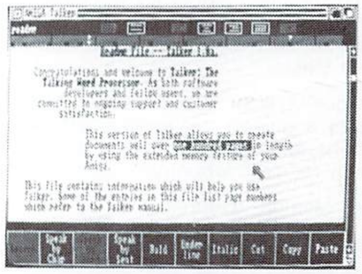
Finally Software
c/o Software Literacy
2255 Ygnacio Valley Rd., Suite N
Walnut Creek, CA 94598
(415) 935-0393

Español Made Easy

Use of Digitized Spanish is a First

The long awaited Spanish tutorial, **Señor Tutor™** is now available. It comes complete with six-diskettes chock full of lesson material. Señor Tutor leads a self-paced beginning Spanish tutorial using both digitized Spanish and synthesized English for high clarity. Señor Tutor comes equipped with its own Spanish-English dictionary. Only $69.95.

Wordprocessing AND Speech in One



John Wagoner, President of Finally Software, conceded recently that numerous people are confused about the purpose of the **Talker™** program. "Many people don't realize that, aside from having optional speech, Talker is a full function WYSIWYG (What You See Is What You Get) word processor with bold, italic, and underline shown on-screen. It also has easy-to-use tab and margin settings as well as headers, footers and page numbering, plus more. Talker is the first word processor to take full advantage of the Amiga's special capabilities." Talker costs a mere $69.96.

Finally Software also offers **Nancy: The Spelling Checker™**. Nancy works with Talker, and other popular word processors as well as ASCII files. It has over 120,000 words in its dictionary - the largest available on the Amiga - and you can even create your own specialized dictionaries. Only $49.95.

mers will be delighted with this extensive and varied collection.

Pre-recorded SMUSic

Unlike disks of samples that don't do anything by themselves, **Symphony Library** disks from Speech Systems stand alone. Each of the eight volumes (disks) contains upwards of 100 SMUS-format prerecorded four-part songs, ranging from classical to popular. Every disk includes a music player and some samples for both Amiga internally and externally MIDI-synthesized sounds. You can play Amiga and MIDI sounds separately or together and cycle through an entire disk.

What's more, SMUSic files will load into composition programs where you can play, edit and print them in standard notation. Speech Systems also has colored MIDI cables and a MIDI interface with a disk of nine SMUSic files.

Construction Workers

Dynamics by Bob Shannon is a collection of files specifically designed for Deluxe-Music Construction Set. They form a music composition tutorial and toolkit with more than 200 rhythm and harmonic patterns that will help you learn to construct melodies and use tools like cut and paste. All of the scores provided on the cassette tape and disk are original, most are previously unpublished, and a couple are truly fantastic. Learning to read standard music notation is addressed, but you should be familiar with it already. Also included are several MIDI utilities and a light-hearted, unpretentious manual.

If you want to get a song out of your heart and into the Amiga—experiment! With the selection of samples available, you could transform "Dueling Banjos" into Ferocious Fiddles or even Cacophonious Cats.

Dynamics
Robert Shannon
741 East #305
Woodland, CA 95695
916/662-9591
$29.95

E.C.T. SampleWare
PO Box 36
Sierra Madre, CA 91024
408/741-0117
$18 per disk, 3 for $40

I.M. Instruments
Actionware
1039 Farmington Ave.
West Hartford, CT 06107
203/233-0151
$20

Sound Advice Music Software
Wavetable Technologies
1647 Willow Pass Rd., Suite 267
Concord, CA 94520
619/455-7663
$18.50 per disk

Sound Effects
Karl R. Denton Associates
PO Box 56
Westland, MI 48185
313/522-0939
$99.95 for six disks

Symphony Library
Speech Systems
38 West 255 Deerpath Road
Batavia, IL 60510
312/879-6811
$39.95 per disk

DOS-2-DOS

Here's your passport to the strange and exciting world of MS DOS.

By R.B. Trelease, Ph.D.

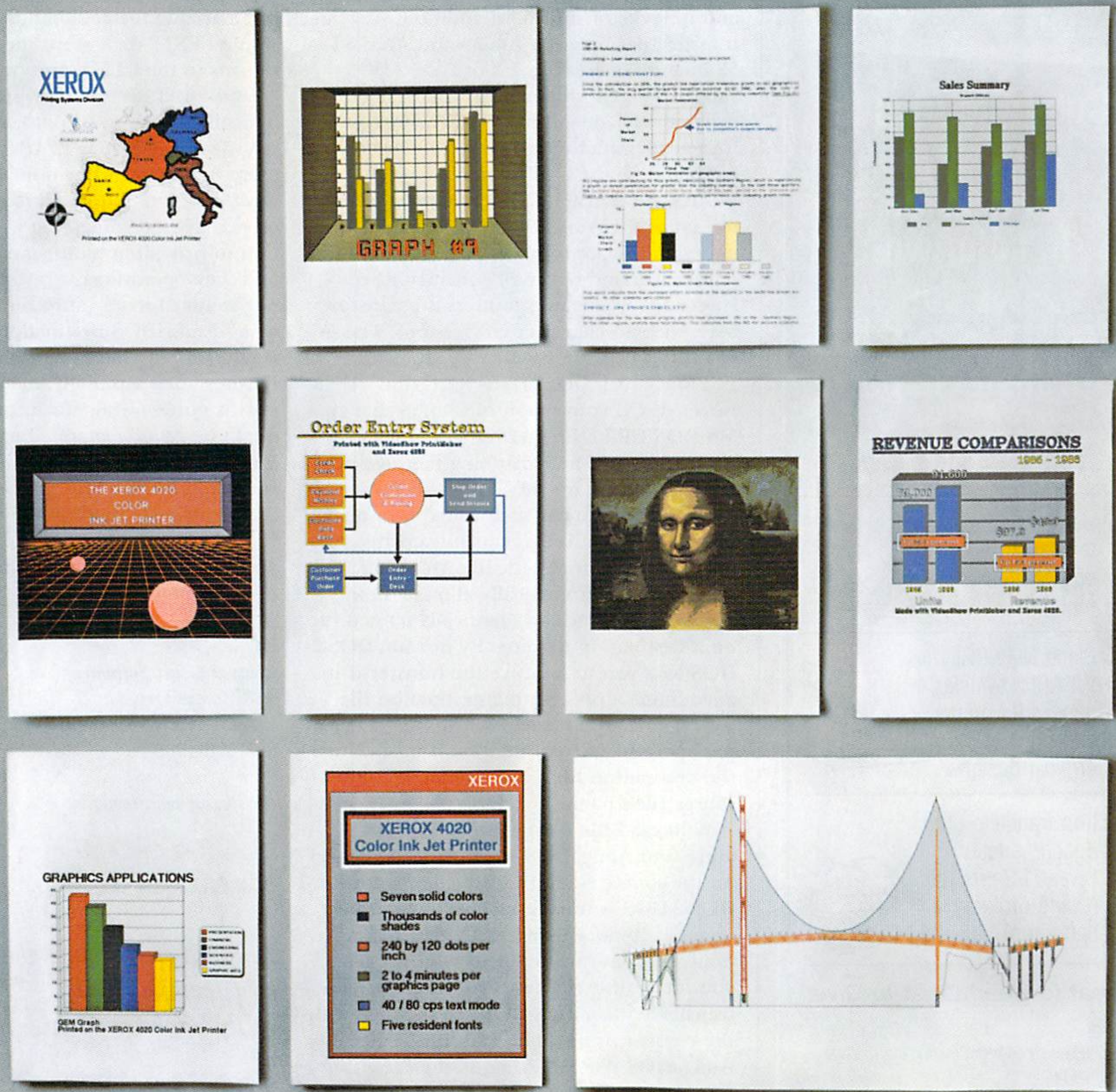
As citizens of a data-processing world dominated by millions of 8088 (PC/MS DOS) computers, Amiga users have sought file and program compatibility with MS DOS systems. DOS-2-DOS from Central Coast Software provides convenient, direct AmigaDOS access to MS DOS media, along with a number of related useful features.

DOS-2-DOS is a compact (26.5K) program that must be run from a CLI window. Very straightforward in its operation, the control language syntax is similar to other AmigaDOS and MS DOS utilities. When DOS-2-DOS runs, it displays its own prompt (D2D>) and accepts a number of commands common to both operating systems. DIR, for example, provides a directory of files on the designated disk. CHDIR changes the current directory/path, and TYPE displays the ASCII contents of a specified file.

Computer Chameleon

DOS-2-DOS provides access to single- and double-sided, 3½-inch and 5¼-inch MS DOS ►

XEROX



The Xerox 4020 Ink-Jet Printer is making headlines with unlimited color.

If you want to make headlines with your next business presentation, try adding color with the Xerox 4020 Color Ink-Jet Printer.



The 4020 is a high-quality, attractively priced printer that mixes text with brilliant color graphics. It employs the latest advances in ink-jet technology to deliver seven distinct colors which combine to produce over 4,000 different shades.

But the 4020 makes more than just a colorful impact. It also has a resolution that few color ink-jet printers can match, prints 2 to 3 times faster than comparably priced color printers, and can be installed by just about anyone in less than 10 minutes.

Like all Xerox products, the reliable 4020 is backed by one of the best service and support organizations in the industry: Team Xerox. To learn more about the 4020 Color Ink-Jet Printer, send in the coupon below or call 1-800-TEAM-XRX, ext. 199A.

Team Xerox

We've got a colorful solution to your business needs.

I'd like to learn more about the 4020 Color Ink-Jet Printer and what it can do for my business presentations.

☐ Please send me more information.
☐ Please have a sales representative contact me.

Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692.

NAME ______ TITLE ______

COMPANY ______

ADDRESS ______ CITY ______

STATE ______ ZIP ______ PHONE ______

Or, if you can't wait, call
1-800-TEAM-XRX, ext. 199A.
199A. (1-800-832-6979, ext. 199A.) 999-6-57

diskettes. The program supports both eight- and nine-sector media. In addition, you can transfer files between Amiga and Atari ST 3½-inch disks. Version 1.3 of DOS-2-DOS supports DF0:, which means that single-drive users can exchange 3½-inch foreign-format files via the Amiga RAM: device.

The familiar COPY command accomplishes file transfer. COPY syntax is similar to that of the AmigaDOS and MS DOS utilities, with the appropriate directory and paths indicated by / and \ characters, respectively. By default, tranfers are byte-for-byte, with no character conversions. The -A extension (e.g., COPY DF1:\UTILITIES\PCPROG.TXT DF0:RT/PCPROG.ASC -A) forces ASCII conversion of files, exchanging MS DOS CR/LF line terminators for AmigaDOS LFs and stripping the high-order bit of all characters. Employing -A removes ASCII control characters from text files, letting you use documents created on foreign word processers, like WordStar. The -R extension automatically allows a new transfer to replace an identically named file on a destination diskette. By default, DOS-2-DOS asks you to approve the transfer if it encounters a pre-existing destination file with the desired name. As with the principal operating system utilities, if unspecified, the destination file's name defaults to the source file's name.

Wild card file designators (MS DOS * and ? and AmigaDOS ? and #?) can be used on the source side of COPY commands. If DOS-2-DOS is transferring an Amiga filename with more than eight characters or double-extensions to MS DOS, it will ask you for a different destination name. Files transferred from MS DOS are stamped with the current Amiga date and time. Original AmigaDOS date and time stamps are transferred to newly created MS DOS copies.

DELETE is comparable to the standard operating system functions, but it doesn't support wild cards. Files must be erased individually by specified filename, although DELETE commands can assume you're using the current directory.

FORMAT properly initializes different types of diskettes, although it does not support the complete range handled by COPY. Using a syntax similar to the MS DOS utility, the command can format single- or double-sided, double density 5¼-inch MS DOS disks. No system files are written to the boot block, so DOS-2-DOS created floppies are not bootable on a PC system. While you can initialize 3½-inch double-sided diskettes (760K), you cannot use 360K single-sided media (Transformer format).

HELP or ? displays a DOS-2-DOS screen summarizing the commands and their examples. EXIT or K stops the program and returns to the CLI system prompt.

DOS-2-DOS is not copy-protected, and it is small enough to fit onto all but the most crowded Workbench 1.2 disks. CLI-based operation seems to be quite suitable for most functions, although icon-addicted users may find something wanting. In addition to providing mouse-mediated point-and-click operations, a revised version might attach icons (.info files) to newly made AmigaDOS destination files, which would simplify handling uploaded files. Furthermore, although Atari ST media support is quite useful, Macintosh file access might be eagerly snapped up by a larger number of Amiga users. While DOS-2-DOS is a very effective tool providing needed MS DOS media compatibility functions, Central Coast Software could still consider adding an item or two to the wish-list for future enhancements.

DOS-2-DOS
Central Coast Software
268 Bowie Drive
Los Osos, CA 93402
805/528-4906
$55
No special requirements.

Marauder II

A quick and easy way to fill your vault with backup disks.

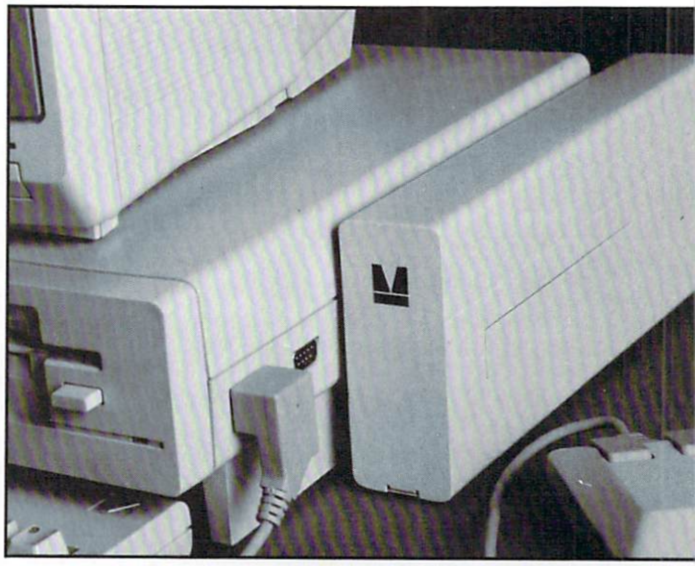
Let's get the disclaimers out of the way up front: I don't like copy protection; it gets in my way and I work around it when I can. On the other hand, I vehemently object to people who cut into the sales of legitimate software developers by illegally selling or giving away copyrighted software. These positions are not irreconcilable: To make copies of software I own for legitimate backup purposes is a right given me (and you) by the U.S. Congress. To copy software for other purposes is a violation of federal law. Marauder II from Discovery Software lets you make copies of copyrighted Amiga software. Everyone knows that Marauder II (and programs like it) will be used by some people to make illegal copies of software. I condemn that practice, but I don't condemn the tool used to do it. Ma- ►

AVAILABLE NOW!

StarBoard2

If you've owned your Amiga® for a while now, you *know* you definitely need more than 512k of memory. You probably need *at least* double that amount...but you might need as much as an additional two megabytes. We want to urge you to use **StarBoard2** as the solution to your memory expansion problem –and to some of your other Amiga-expansion needs as well!

Auto-Configuring Fast RAM
Zero Wait States
User Expandable from 512k to 2 Megabytes
Bus Pass-Through
MultiFunction Option: battery/ clock, FPU, parity, Sticky-Disk



It's small, but it's BIG–

Since most of you want to expand your Amiga's memory without having to also expand your computer table, we designed **StarBoard2** and its two optional "daughterboards" to fit into a sleek, unobtrusive Amiga-styled case that snugly fastens to your computer with two precision-machined jackscrews.

The sculpted steel case of **StarBoard2** measures only 1.6" wide by 4.3" high by 10.2" long. You can access the inside of the case by removing just two small screws on the bottom and pulling it apart. We make **StarBoard2** easy to get into so that you or your dealer can expand it by installing up to one megabyte of RAM on the standard **StarBoard2** or up to two megabytes by adding in an Upper Deck.

This card has decks!

The basic **StarBoard2** starts out as a one megabyte memory space with 0k, 512k, or one megabyte installed. If you add in an optional **Upper Deck** (which plugs onto the Main Board inside the case) you bring **StarBoard2** up to its full two megabyte potential. You can buy your **StarBoard2** with the Upper Deck (populated or unpopulated) or buy the Upper Deck later as your need for memory grows.

And you can add other functions to **StarBoard2** by plugging in its second optional deck –the Multifunction Module!

StarBoard2: functions five!

If we count Fast Memory as one function, the addition of the **MultiFunction Module** brings the total up to five!

THE CLOCK FUNCTION:

Whenever you boot your Amiga you have to tell it what time it is! Add a MultiFunction Module to your **StarBoard2** and you can hand that tedious task to the battery-backed, real-time clock/calendar. A small piece of MicroBotics software in your WorkBench Startup-Sequence reads the clock and automatically sets the time and date in your Amiga. And the battery *is* included (we designed it to use an inexpensive, standard AAA battery which will last at least two years before needing replacement).

THE FLOATING POINT FUNCTION:

If any one aspect most characterizes the Amiga it's *fast* graphics! Most graphic routines make heavy use of the Amiga Floating Point Library. Replacing this library with the one we give you with your MultiFunction Module and installing a separately purchased Motorola 68881 FPU chip in the socket provided by the Module will speed up these math operations from 5 to 40 times! And if you write your own software, you can directly address this chip for increased speed in integer arithmetic operations in addition to floating point math.

THE PARITY CHECKING FUNCTION:

If you install an additional ninth RAM chip for every eight in your **StarBoard2**, then you can enable *parity checking*. Parity checking will alert you (with a bus-error message) in the event of any data corruption in **StarBoard2**'s memory space. So what good is it to know that your data's messed up if the hardware can't fix it for you? It will warn you against saving that data to disk and possibly destroying your database or your massive spreadsheet. The more memory you have in your system the more likely it is, statistically, that random errors will occur. Parity checking gives you some protection from this threat to your data residing in Fast RAM. Note that the Amiga's "chip" RAM cannot be parity checked.

THE IMMORTAL MEMORY DISK FUNCTION (STICKY-DISK):

When you've got a lot of RAM, you can make nice big RAM-Disks and speed up your Amiga's operations a lot! But there's one bad thing about RAM-Disks: they go away when you re-boot your machine. Sticky-Disk solves that problem for you. It turns all of the memory space inside a single **StarBoard2** into a Memory Disk that will survive a warm-reboot! When your Amiga attempts to grab a **StarBoard2** in Sticky-Disk mode, a hardware signal prevents the system from acquiring the **StarBoard2** as FastRAM (and thereby erasing your files) –instead it is re-recognized as a Memory Disk and its contents are preserved intact. If you want to work rapidly with large files of data that are being constantly updated (such as when developing software) you can appreciate the Sticky-Disk!

Fast RAM –no waiting!

StarBoard2 is a *totally* engineered product. It is a ZERO WAIT-STATE design, auto-configuring under AmigaDOS 1.2 as Fast RAM. Since AmigaDOS 1.1 doesn't support autoconfiguration, we also give you the software to configure memory in 1.1.

Any applications software which "looks" for Fast RAM will "find" **StarBoard2.** And you'll find that your applications run more efficiently due to **StarBoard2** on the bus.

A passing bus? Indeed!

What good is an Expansion Bus if it hits a dead end, as with some memory cards? Not much, we think –that's why we carefully and compatibly passed through the bus so you could attach other devices onto your Amiga (including another **StarBoard2**, of course!).

The sum of the parts...

A really nice feature of the **StarBoard2** system is that you can buy exactly what you need now without closing off your options for future exapansion. You can even buy a 0k **StarBoard2** (with a one megabyte capacity) and populate it with your own RAM (commonly available 256k by 1 by 150ns memory chips). When you add **StarBoard2** to your Amiga you have a powerful hardware combination, superior to any single-user micro on the market. See your Authorized Amiga Dealer today and ask for **StarBoard2**

SUGGESTED RETAIL PRICING:

StarBoard2, 0k (1 meg space):	$349
StarBoard2, 0k (2 meg space):	$395
StarBoard2, 512k (1 meg space):	$495
StarBoard2, 1 meg (1 meg space)	$595
StarBoard2, 2 megs installed:	$879
StarBoard2, 2 megs & MultiFunction:	$959
Upper Deck, 0k (1 meg space):	$ 99
MultiFunction Module:	$ 99
also available:	
Standard 256k memory card:	$129
MAS-Drive20, 20 meg harddisk:	$1495
MouseTime, mouseport clock:	$ 50

MicroBotics, Inc.
811 Alpha Drive, Suite 335, Richardson, Texas 75081 / (214) 437-5330

Circle 103 on Reader Service card.

rauder II is an excellent utility; one I recommend to anyone who likes the security of backing up their programs.

Marauder II is the easiest copy utility I've encountered for any computer system. When you run the program, you encounter Marauder II's own copy protection: You're asked to enter a word from a specified page and line in your manual. Enter the correct word and the program continues, otherwise the program stops. The idea here is to make the program easily copyable by legitimate owners and to deter illegal distribution by forcing people to go to the trouble of copying the manual as well.

The main Marauder II screen pictures an Amiga 1000 and three external Amiga drives. Above the drives are two lines of boxes; the upper one marked "Source" and the lower one, "Target." By clicking on these boxes, you designate where you will place the disk you're copying and the disk(s) you're copying to. Marauder II lets you make up to four copies of a disk at a time (providing you have four floppy drives attached to your Amiga and want to swap the source and destination disks). Most people, having two disk drives, will place the source disk in one drive, the destination disk in the other, and avoid swapping by making one copy at a time. You can also designate source and destination disks by inserting and removing disk icons from the pictures of the drives. Drive selection is done against a scrolling rainbow of colors on an overscan screen—a nice touch.

Doing the Dirty Work

Once you've designated your drives, you press the start button to begin copying. If the program you're copying is listed in the Backup List found on the Marauder II disk, it will be copied easily. If it doesn't appear, it may be copied anyway. Discovery Software constantly updates its backup list and makes it available to registered owners via disk updates and a special modem line. When copying, messages appear in the screen of the Amiga telling you what is going on. If the program detects a non-DOS track on the disk, as it invariably will when copying copy-protected software, it will give you a message when copying is complete that the destination disk may be corrupted. The message may be over-caution on the developer's part. When I got this message, the copies were invariably good.

Marauder II has four options available from a menu. Index Sync tells the program to align the starting point of each track with the index hole of the source diskette. This slows down the copy process, but it may be needed by some software. The verification option has the program verify that what is written to a disk is what it read from the source. You can also choose between Analytical and Verbatim copy modes. Since Discovery Software recommends you always use Analytical mode, I don't know why they included the Verbatim mode. The final menu option lets you perform a speed check on any of your drives. If your drive speed falls outside of a specified range, you may need to have the drive adjusted.

Software Striptease

Also on the Marauder II disk are some interesting utilities. Reflector3 lets you copy The Mirror, another disk copying program and Marauder II's main commercial competitor. Decoder strips the copy protection from some popular programs so you can move them to a hard disk. Decoder only works with about a half-dozen programs—all from Electronic Arts—that require special treatment to strip away copy protection. More programs aren't included with Decoder because of one of the more important features of Marauder II; it automatically modifies many of the programs it copies so that the programs can subsequently be copied with the AmigaDOS Diskcopy command. Although this feature of the program isn't mentioned in the manual (it gets a mention in a ReadMe file), it is of great importance to people who want to move programs to hard disks for greater convenience. My only problem with this feature is that some of the programs that Marauder II deprotects are games. I have no quarrel with a program that deprotects productivity and business software, but I think deprotecting games is unneccessay and may encourage illegal distribution. Other utilities on the disk are DiskErr, which checks disks for unreadable data, and DiskWipe, a quick and dirty tool for erasing disk.

For a package that does so much, Marauder II is remarkably easy to use. The ready availabilty of upgrades serves to keep the program current with trends in copy protection. Marauder II is an excellent utility at a bargain price.

—B. Ryan

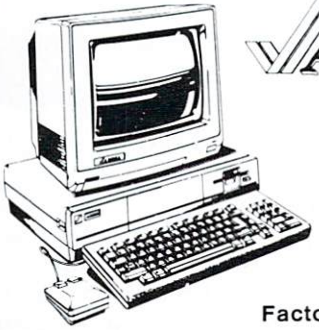
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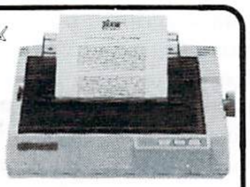
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Hacker

You're not supposed to be here. You don't know what's going on. You don't know what you're doing. Somehow, you managed to log onto the system, and you're stumbling deeper into a clandestine operation. Is it some kind of sinister plot? A conspiracy? You're not sure, but it seems to be of international proportions.

Hacker is an illustrated adventure that gives you the chance to break into someone else's computer system without facing the legal consequences. The manual tells you how to load the disk—that's it. You're on your own. You're a hacker breaking into a computer system.

After logging on, you find that you've gained access to the system of a company called Magma, Ltd. You don't know who they are or what the confidential Magma Project is all about, but they seem to be up to no good. The system instructs you to travel around the globe and negotiate with spies to obtain the pieces of a shredded document that, maybe, will help you to unravel the mystery.

One of Hacker's strong points is that there are no complicated rules to remember; in fact, there are no rules at all. Your logic and common sense are all you have to get you from one point to the next. Also, Hacker overcomes one of the problems that plagues many adventure games: You don't have to struggle with rules of syntax and a limited dictionary to interact with the program.

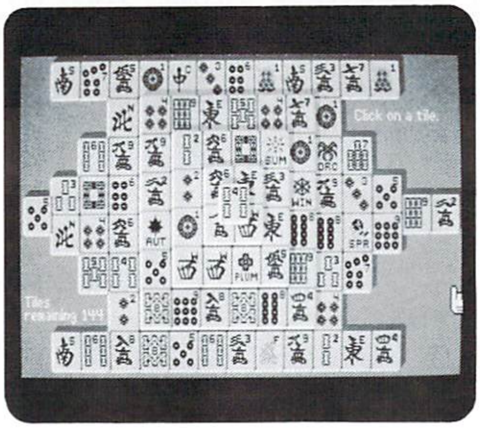
If you enjoy adventures, mysteries, puzzles and brainteasers, then you should like Hacker. But be prepared for frustration... and failure. This game's not easy to fathom. If you get hopelessly stuck, Activision will send you a set of Hacker Hints. *($44.95, Activision, Inc., 2350 Bayshore Frontage Road, Mountain View, CA 94043, 415/960-0410. No special requirements.)*

—S. Laflamme

Shanghai

Shanghai is a "table" game based upon the Chinese game *Mah Jongg*. The Amiga randomly sets up titles in an arrangement called the dragon. The tiles are chosen as pairs and removed from the board. Tiles must be in the proper locations to be removable. An ancient Chinese "surprise" awaits those who clear the board.

The game can be played by one, in teams or by two in a timed competition. Though playing in competition forces you to think fast, the most pleasure of this game, I think, comes from playing it alone. It is absorbing, addictive and hasn't bored me yet. The computer makes it easy to play, but not easy to win. And the graphics have a well drawn three-dimensional look. The secret, however, to the excellence of this game does not come from the computer, but from the game. It is at once simple and very complex. It has the timeless quality of a great game in itself. This is the Amiga game I have played and enjoyed the most. If you want an excellent strategy game, buy Shanghai. *($44.95, Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043, 415/960-0410. 512K required.)*



—V. Laughner

Mindwalker

This action-strategy game from Commodore has been around for awhile and is still one of the best games for the Amiga. It ranks very high in graphics, sound and overall concept. You are a mad physics professor wandering the recesses of your own mind, trying to reconstruct your lost sanity. You have four sides to your "ego": a human, a wizard, a spriggan (a flying fantasy creature) and a water nymph. You travel across the elaborate grid of the Mind, tracing a "path of coherent thought" and battling Nihilism Beams and your own Bad Thoughts with powerful charges of electricity. Having plotted the proper course across the Mind, you take a Tube into the Brain and battle neurons as you search for Shards of Sanity. You then enter into the Subconscious where you piece together your lost sanity. The process gets more and more difficult as you go along.

This is a very successful joining of superb graphics, sound, action and story. Though confusing at times, the game manages to hold your interest with its character changes, bizarre sounds and magical effects. You'll own a real sense of power from zapping things with the bolts of electricity! Despite its age, Mindwalker is one of the best animated adventure games for the Amiga. *($49.95, Commodore Business Machines Inc., 1200 Wilson Drive, West Chester, PA 19380, 215/431-9100. Joystick required.)*

—V. Laughner

Strip Poker

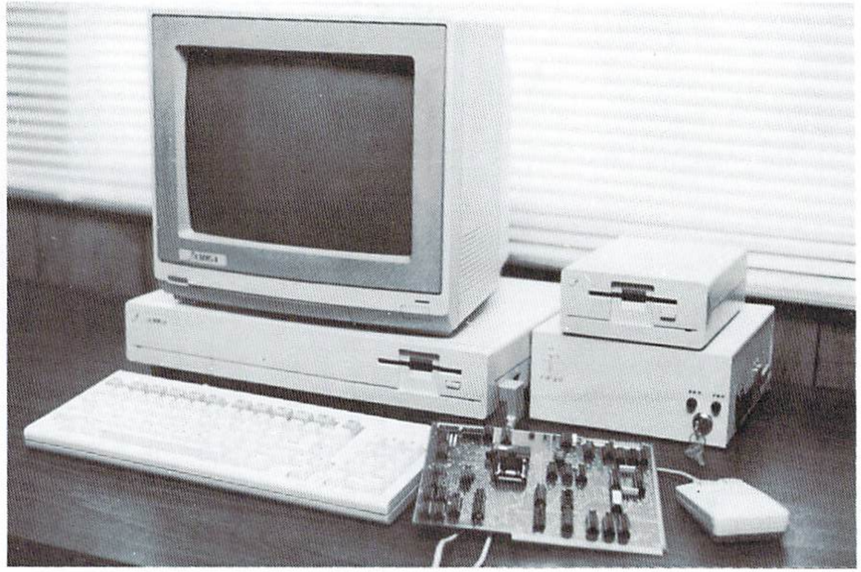
Strip Poker is a fairly mindless game for the Amiga that should entertain the desperate or immature for about 20 minutes, depending upon one's luck or poker playing abilities. If you have no luck at all, then you might have to play the game for 45 minutes. (Of course, if you paid money for this game, then it is evident that you don't have much luck to begin with.) You play five card draw against two rather crudely drawn women. (Artworx claims there are other data disks with new female and male opponents available, but we haven't seen them.) You and your opponent each start with $100, and when either of you loses more than that amount you "borrow" $100 more in exchange for an article of clothing. When a player loses all their clothing the game is mercifully over.

There are only a few things about the game that are Amiga specific. One, you play it on an Amiga. Two, when either opponent loses $100, a digitized female voice says something cerebral like "gee whiz!" or "oh darn!" There is a "modesty switch" for blanking the screen in case Mom walks by.

Strip Poker isn't very erotic. It isn't very fun to play. The graphics may have been really swell on a VIC-20, but not on an Amiga. This program is one that you might play for an afternoon one day, put it away and never play it again (until a depraved friend comes over and pesters you into letting him see it). This program isn't degrading; it is embarrasingly stupid. Strip Poker could give computer pornography a bad name. *($39.95, Artworx Software Company Inc., 1844 Penfield Rd., Penfield, NY 14526, 800/828-6573. 512K required.)* ■

—G. Wright

PERFORMANCE !



Isn't that what motivated you to purchase an Amiga? Now meet the FIP 20; the only hard disk worthy of marriage to an Amiga. The facts of the matter are these; the FIP 20 is the fastest, most reliable yet economically priced unit available for the Amiga. Use your own stop-watch and compare us to any hard disk system on an pc at any price! The FIP 20 has its own microprocessor and multiple sector buffers. Thus allowing our DMA channel to perform at **speeds** in excess **25 million bits/second.** The dedicated hard disk processor means that 68000 overhead is kept to an absolute minimum. All this intelligence allows the hard disk to be very **independent.** Many hard disk operations occur at literally the same time the Amiga is performing other tasks, this parallelism can even extend across multiple drives. The FIP 20 controller is capable of operating up to four drives, giving you an awesome total of over 320 megabytes of **fast**, yet **quiet** mass storage. You can even use one of the hard disk ports for our 60 megabyte streaming tape back up.

While the speed of the FIP 20 is astounding, we have not forgotten performance or reliability. We have the industry's most powerful error correction codes implemented into our hardware. So problems that cause other drives to trash your data and give you a guru are easily handled by the FIP 20. Our drives are shock mounted so that they can withstand 50 G's of shock, worry about accidentally jarring our drive while it is running has been eliminated.

The FIP 20 is currently undergoing FCC class B certification, and will soon be available for both the Amiga 1000 and 2000. The FIP 20 comes complete with a two slot ZORRO chassis, power supply, controller for four drives, and a 20 megabyte drive, all for a fantastically incredible price of $1099 (shipping included).

Our research and development department is **totally** committed to the Amiga 1000 and 2000, and is staffed by **engineers** who have been given a free reign in the development of Amiga products. The quality and performance of products that we will introduce over the next few months will both amaze and please you, just wait until you see what we plug into the extra slot in our expansion chassis!

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What's New?

The standard mixture—emus, aquariums, telescopes and black boxes.

Compiled by Linda Barrett

In Sync

Desktop video has stepped up to broadcast quality with the **RM2 Professional Genlock Subsystem** from Burklund & Associates. Synchronizing professional video equipment with Amiga graphics, the RM2 accepts input from a television camera or any other RS-170A video source.

Although engineered to be coupled with a live source, the RM2 can operate in a master mode, generating its own RS-170A synchronization signals. For flexibility, the unit is designed of plug-in modules for color decoding, encoding, keying and genlocking functions, among others.

Front panel controls include an A-B fader for mixing live and graphics video, a color bar generator switch, decoder signal adjustment knobs and controls to compensate for varying lengths of cable between the Amiga and live sources. The rear panel houses 22 BNC connectors.

Inside the 19-inch, rack-mountable box, TTL circuitry is encased in thin-film modules in 24-pin metal packages to reduce time and phase jitter. Attempting to minimize crosstalk and eliminate on-screen herringbone patterns, Burklund used microcoaxial cabling among video leads and circuits.

Burkland is planning to expand the basic unit, and is already offering an optional keyer and a jumper to genlock graphics boards for IBM PCs and compatibles. A Chroma-key module to allow live video overlay of computer graphics and genlocking of several Amigas at the same time are currently under development. One BNC output will currently accept a planned "black burst" output to produce a pure black signal.

The RM2 retails for $2,500. Direct your questions to Burklund & Associates, 3903 Carolyn Ave., Fairfax, VA 22031, 703/273-5663.

Star Gazing

Who needs a telescope when you've got an Amiga? Drawing on a database of over 1,600 stars, **Galileo**, from Infinity Software, can show the sky from any point on Earth for any date in the 20th century. You can scroll to any part of the sky to identify constellations, planets and over 400 deep-sky objects. The program calculates the times planets or stars rise and set and plots their pathways. You can even view a solar eclipse without sunglasses.

Selling for $99.95, Galileo is available from Infinity Software Ltd., 1331 61st St., Suite F, Emeryville, CA 94608, 415/420-1551.

Gone Fichin'

Software Visions offers a database with a twist. **The MicroFiche Filer** requires no programming to set up; instead, data is organized on microfiche. To locate your information, simply drag a "magnifying glass" over a condensed, two-dimensional sheet of text and pictures of any size. For a customized display, you can shrink or stretch the graphics and reformat the entire microfiche.

The MicroFiche Filer is being offered for $99. For more information, contact Software Visions Inc., 26 Forest Road, Framingham, MA 01701, 800/527-7014 (in MA, 617/877-1266).

Mystery, Missions And Missiles

As Yogi Berra once said, "It's like déjà vu all over again." Whether or not he was referring to Mindscape's new game, **Uninvited**, is still under debate. Employing the same mouse-only system as the popular adventure Deja Vu, Uninvited opens with you crashing your car during a thunder storm in front of a house that's straight out of *The Adams Family*. Your brother has disappeared from the wreckage, leaving you to approach the house and ask for help alone. From there things get worse.

In **Sinbad and the Throne of the Falcon**, things can't get much worse. The Caliph was transformed into a falcon during the night, and Sinbad—i.e., you—must sail the world to learn how to save him. Meanwhile . . . back at the palace, the Black Prince's troops are attacking and you must maneuver the Caliph's armies to defend the city. The game is really two in one: an adventure as you sail the seven seas searching for clues, plus a war strategy game as you defend the city.

Also new from Cinemaware is **S.D.I.**, a high-pressure mix of the arcade and adventure. If you think the world is in turmoil now, you should see things in 2017. With the U.S. nearing completion of S.D.I, the Soviet Union is having another revolution. Convinced the Americans will cripple the Soviets with the defense system, the revolutionaries have taken control of Soviet missile sites and space ports. Your mission as Captain Sloan McCormick of the Orbital Marines is to destroy KGB attack fighters, protect and repair the S.D.I. system and defend America from a nuclear attack. The Soviet government has pledged their help, in the form of Commander Natalya Kazarian, your old flame from the joint Soviet/American mission to Mars.

Each of the three games retails for $49.95. Contact Mindscape, 3444 Dundee Road, Northbrook, IL 60062, 312/480-7667.

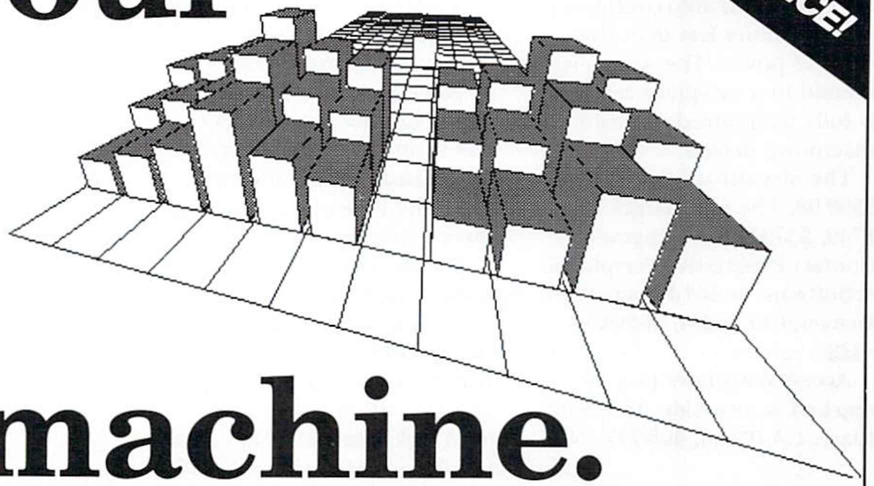
A Duo of Deuces

If your programs are getting cramped, perhaps it's time to expand your memory. Progressive Peripherals & Software's **MegaBoard 2** adds two megabytes of fast RAM to the Amiga 1000. Fully populated, the board auto-configures with 1.2 ►

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software and plugs into the side expansion bus; the MegaBoard 2 has a 90-day warranty.

Not to be outdone, Access Associates has upgraded their 512K **Alegra** unit to two megabytes. Connecting to the side bus, the board auto-configures and consumes less than five watts of power. The Alegra is housed in a two-piece case and is fully warranteed against manufacturing defects.

The MegaBoard 2 sells for $599.98. The new Alegra is $749, $379 for the upgrade. Contact Progressive Peripherals & Software at 464 Kalamath St., Denver, CO 80204, 303/825-4144.

Access Associates may be reached at 491 Aldo Ave., Santa Clara, CA 95054, 408/727-8520.

Double Talk

Aegis lets you do everything at once with **Diga!**, their new telecommunications program. With Doubletalk file transfer, you can send and receive a file while talking with the other user. Diga! uses a packet system to send and receive information, and confirms file integrity after a transmission. With a BASIC-like programming language, you can create automated sessions—Scripts—to capture data, do branching and add conditionals. You can create custom terminal emulators, including the Tektronix 4010. VT100 emulation uses overscan, the 132-column display and up to 50 lines of text on screen. For $79.95, Diga! provides password protection, Kermit, Xmodem and batch-file transfer protocols and 10 programmable function keys. For more details, contact Aegis Development, 2115 Pico Blvd., Santa Monica, CA 90405, 213/392-9972.

Under Control

RS Data Systems' **Phoenix** is not a myth, nor must it consume itself in flames before running. The Phoenix is a hard-disk controller for the Amiga 1000 capable of handling up to four ST506/412 drives, plus a two-gigabyte laser disk and a streaming tape back-up unit. The auto-configuring controller's DMA channel with on-board sector buffers can transfer data at approximately 25 megabits per second, the Amiga expansion bus limit. DMA transfers from the sector buffer parallel transfers from the hard disk. The Phoenix also supports three error correction codes.

The Phoenix comes with a power supply, cables, auto-configure back-plane, expansion enclosure and driver software. You may purchase it alone or with a 20, 40 or 80 MB MiniScribe hard disk. The controller alone retails for $450, with a 20 MB hard disk, $995. Designs for the Amiga 500 and 2000 are under development. Contact RS Data Systems, 7322 Southwest Fairway, Suite 660, Houston, TX 77074, 713/988-5441.

PHASAR Face-Lift

PHASAR: The Financial Manager is now being distributed by Finally Software. Version 2.3 features an enhanced user interface and sells for $99.95. Contact Finally Software Inc., 4000 MacArthur Blvd., Suite 3000, Newport Beach, CA 92663, 714/722-2922.

Expanding Inward

Requiring no cuts or soldering, Spirit Technology's three new memory boards mount in the Amiga 1000 chassis under the FCC radiation sheild. The **ST-15** provides an additional 1.5 MB to the standard 512K; the **ST-10** adds one megabyte, while the **ST-5** provides 0.5 MB. All include a time/calendar with a battery back-up and leap year provision. Featuring zero wait-state, the auto-config boards will add to any external memory.

The ST-15 lists at $599.50, the ST-10 at $499.50, and the ST-5 at $349.50. You can purchase the time/calendar (ST-TC) separately for $59.50. To order, contact Spirit Technology, 220 West 2950 South, Salt Lake City, UT 84115, 800/433-7572.

A Sea of Sinewaves

Just when you thought you'd seen it all, along comes **Doug's Math Aquarium**. The program plots mathematical functions in wire frame mode with hidden line removal and in flat contour mode using color to represent altitude. Besides all scientific and transcendental functions usually included in a computer language, Doug's Math Aquarium swimmingly handles recursive functions, like the Mandelbrot set. To minimize drawing time, expressions are compiled.

If you're not a math whiz, a variety of formulas and pictures already populate the Aquarium. Those who have taken the plunge can generate formulas, or alter those included to study their behavior. Doug's Math Aquarium retails for $79 (seaweed not included). Contact Seven Seas Software, PO Box 411, Port Townsend, WA 98368, 206/385-3771.

Some Assembly Required

Metacomco, authors of the original Amiga Assembler, just outdid themselves with the **Macro Assembler**. The enhanced assembler provides macro expansion directives compatible with Motorola specifications and supports the full Motorola instruction set. The system includes a linker, Amiga libraries and a full-screen editor. Code is position independent or relocatable, while all listings are page-formatted to show the instruction line, the code produced and the relative offset address. External references allow you to link assembler modules and programs written in assembler or any higher-level language. All arithmetic uses 32-bit values, offering a wide range of expressions. Conditional directives are also included. In case of disaster, error messages can be written to the console or flagged in a listing. A 60-page manual is provided.

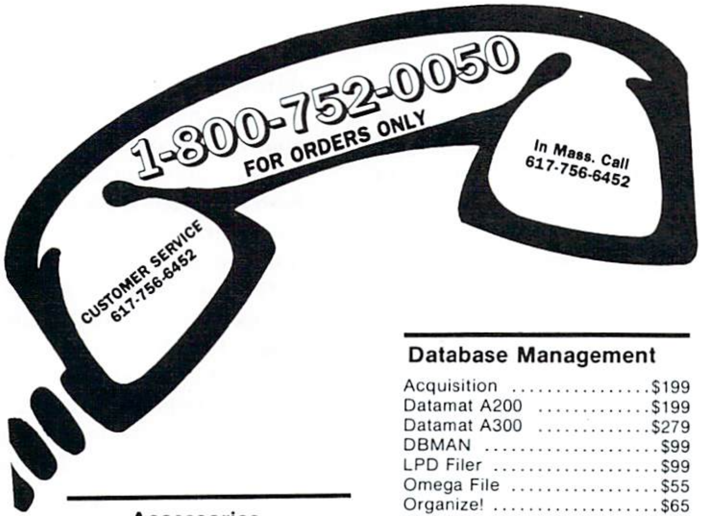
Macro Assembler retails for $99.95. For more details, contact Metacomco plc, 26 Portland Square, Bristol, England BS2 8RZ, 011-44-272-428-781.

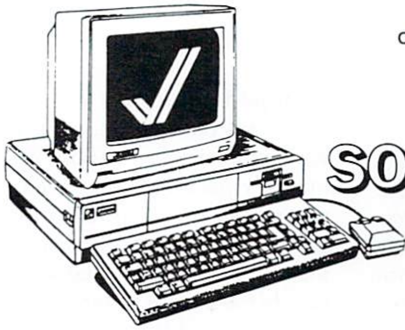
Computer Classroom

If your children need a summer refresher course, MicroEd and The Other Guys have several new educational packages. To its already extensive line, MicroEd adds **Beginning Counting** ($39.95, two disks), **Making Our Constitution** ($79.95, four disks), **Transcontinental Railroad** ($39.95) and two volumes of **Learning American English as a Foreign Language** ($89.95, five disks each). The programs use the same approach as MicroEd's previous offerings, coupling practice question-and-answer sections, quizzes and digitized pictures. English as a Foreign Language concentrates on listening comprehension rather than the standard goal of correct pronunciation. Both the language programs and Beginning Counting use the Amiga voice.

The Other Guys' programs concentrate on learning through game-play with graphics, speech and music. **Match-It** ($39.99) teaches basic colors and shapes. **Math-a-Magician** ($39.99) covers four skill levels of addition, subtraction, multiplication and division of whole numbers and fractions. **Talking Storybook** ($49.99) will read to a child using up to 10 voices per story, or speech can be turned off, leaving the text for you or your child to read. Additional stories (from $24 to $39.99) are available ranging from history ►

Circle 134 on Reader Service card.





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to fairy tales and classics to mythology.

Educational for all ages is **Promise** ($49.99), a spelling checker from The Other Guys. The memory-resident dictionary contains 95,000 words, plus you can make custom dictionaries.

Direct your questions to MicroEd Inc., PO Box 24750, Edina, MN 55424, 612/929-2242 and The Other Guys, 55 North Main St., Suite 301-D, PO Box H, Logan, UT 84321.

Birds of a Computer Chip . . .

Besides having one of the most distinctive names in the software market, Emusoft Corp. has released the **ES-5C Programmable, Scientific Calculator**. Similar in layout and function to Hewlett-Packard's HP-15C, the ES-5C handles logarithmic, trigonometric and hyperbolic functions; statistics and probability, linear regressions, polar and rectangular coordinates and fixed point, scientific and engineering notation. No memory partitioning is needed; you can store and recall programs from disk. Fully programmable, the color calculator retails for $19.95. Contact Emusoft Corp. at 1400 Chicago Ave. #303, Evanston, IL 60201, 312/869-6676.

Video Inkwell

Now you can really make your text stand out from the rest. **The Calligrapher** lets you design your own fonts sized from 1 × 1 pixels to 256 × 160 pixels. Each up to 16-color character can be resized, italicized up to 45 degrees to the left or right and underlined. All fonts conform to the Amiga text and disk formats, but two or more color fonts require the included Font Fixer patch to work with commercial programs.

Editing features are numerous. You have eight predefined brushes with a grab function to create more, all of which can be spun, flipped and rotated, or you can load in DeluxePaint brushes and patterns. You can magnify the text two to 24 times then adjust spacing, width, kerning and the baseline. Characters can be copied, merged to front or back and replaced.

The package sells for $100, or you can purchase a demo disk for $5. For all the details, contact Inter/Active Softworks, 57 Post St., Suite 811, San Francisco, CA 94104, 415/956-2660.

Worse Than Taxes

Infocom's **Bureaucracy** by Douglas Adams (*The Hitchhiker's Guide to the Galaxy*) has enough convoluted logic and obscure forms and rules to make the government proud. In this text adventure, you've just got a new house, and a new job, which requires you to take an orientation seminar in Paris. However, the bank had a problem with your change of address form . . . and your check hasn't arrived. What follows is a romp through the bowels of bureaucracy.

The game sells for $39.95. Contact Infocom at 125 Cambridge Park Drive, Cambridge, MA 02140, 617/429-6000. (Call between 10:11 am and 2:22 pm, unless your name begins with P–Z, in which case call between 2:22 am and 10:11 pm, excepting the hours above, unless you had Fruit-Loops for breakfast, in which case . . . .)

Juggler's Newsletter

Due to the popularity of Eric Graham's Juggler ray-tracing program (see our May/June '87 cover), the Grahams are starting a newsletter on ray-tracing techniques. For details, write to: Cathryn Graham, PO Box 579, Sandia Park, NM 87047.■

Hors d'oeuvres

Unique applications, tips and stuff

You may be using your Amiga at work, at home, or in the back seat of your car, but somehow you'll be using it in a unique way. You will discover things that will let you do something faster, easier or more elegantly.

AmigaWorld would like to share those shortcuts, ideas, things to avoid, things to try, etc., with everyone, and we'll reward you with a colorful, appetizing, official *AmigaWorld* T-shirt. (Just remember to tell us your size.)

Send it in, no matter how outrageous, clever, humorous or bizarre. We will read anything, but we won't return it, so keep a copy for yourself. In cases of duplication, T-shirts are awarded on a first come, first serve basis.

So, put on your thinking berets and rush those suggestions to:

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Circle 41 on Reader Service card.

from p. 22

Listing 1. audiotools.c

```
/* audiotools.c -- includes sample main routine */
/* Copyright 1987, Robert A. Peck, All Rights Reserved  */
/* Lattice (3.03 or 3.10):  lc -v-L ram:audiotools.c */
/* Manx (3.40A with patch v1.3):
    cc +L ram:audiotools.c ln +A ram:audiotools.o c.lib */
#define DEBUG 1
#include "exec/types.h"
#include "exec/memory.h"
#include "devices/audio.h"
#include "ram:audiotools.h"
#include "ram:globals.c"
main()
{
   LONG i, channel, error;
   InitAudio();
   for(i=0; i<4; i++)
   { channel = GetChannel(-1);
     if(channel == -1)  finishup("cannot get a channel!");
/* Here, must save globals from gotkey, gotunit */
       key[i] = gotkey;  /* save allocation key */
       unit[i] = gotunit;/* save unit value     */
       error = StopChannel(channel);
       if(error)
       { printf("error in stopping channel =
                                 %ld\n",error);
         finishup("StopChannel did not work as expected");
       }
   }
/* (channel, note, waveform, vol, dur, pri, mess) */
   for(i=0; i<95; i++)
   {
      PlayNote(0, i, w1, 32, 250, 0, 0);
                              /* all notes, 1/4 sec. */
   }
   error = StartChannel(0);
   Delay(800);  /* let most of them play...
                               this waits 16 seconds */
   for(i=1; i<4; i++)
   {   error = StartChannel(i);
   if(error)  printf("error starting channel =
                                        %ld\n",error);
   }
   PlayNote(0, 23, w1, 32, 2000, 0, 0);
   PlayNote(1, 27, w2, 32, 2300, 0, 0);
   PlayNote(2, 30, w3, 32, 2600, 0, 0);
   PlayNote(3, 35, w1, 32, 2900, 0, 0);
   FinishAudio();
   return(0);
}  /* end of main() */
/* ALL ROUTINES THAT FOLLOW MAKE UP THE SOUND LIBRARY */
InitAudio()
{
    int error,i; /* Declare all message blocks available */
    for(i=0; i<AUDBUFFERS; i++) { inuse[i] = NO; }
          /* Open device but don't allocate channels */
    openIOB.ioa_Length = 0;/* (no allocation table) */
    error = OpenDevice("audio.device",0,&openIOB,0);
    if(error) finishup ("audio device won't open!");
           /* Get the device address for later use */
    device = openIOB.ioa_Request.io_Device;
 /* Create ports for replies from  channels as well as one
   to be used for the control and synchonous functions */
   for(i=0; i<4; i++)
   {auReplyPort = CreatePort(0,0);
    replyPort[i] = auReplyPort;
    if(auReplyPort == 0) finishup("cannot create a port!");
    chipaudio[i] = 0; /* have not yet created the waves */
    datalength[i] = 1; /* used for custom sound samples */
    }
    controlPort = CreatePort(0,0);
    if(controlPort == 0)
                finishup("can't create control port");
    error = MakeWaves();
    if(error == -1) finishup("waves no fit in RAM");
    for(i=0; i<4; i++)
    { dynamix[i] = 0; } /* no dynamic I/O blocks
                  allocated for any channel thus far */
    return(0);
}  /* end InitAudio */
FinishAudio()
{
    LONG i;
    struct ExtIOB *iob;
    for(i=0; i<AUDBUFFERS; i++)
    {   if(inuse[i] == YES)
        {  /* make sure all global blocks are done */
           WaitIO(&audbuffer[i]);
        }
    }
#ifdef DEBUG
    printf("All global I/O blocks are done\n");
    printf("channels 0,1,2,3 have %ld,%ld,%ld,%ld
            blocks in play\n",dynamix[0], dynamix[1],
                               dynamix[2], dynamix[3]);
#endif DEBUG
    for(i=0; i<4; i++)
    if(dynamix[i]) /* If this channel still playing a
dynamically allocated block, wait for all messages to
return before the program exits. */
        {
    emptyit:
     iob = (struct ExtIOB *)GetMsg(replyPort[i]);
     if(iob == 0 && dynamix[i] != 0) /*if no message*/
        {WaitPort(replyPort); /*arrived wait for I/O*/
           goto emptyit;   /*done and empty the port*/
        }
     FreeIOB(iob,i);
     if(dynamix[i] != 0) goto emptyit;
       }
    }
    for(i=0; i<4; i++)   FreeChannel(i);
    finishup("Done!\n");
return(0);
}  /* end FinishAudio */
finishup(string)
char *string;
{
    int i;
    if(device) CloseDevice(&openIOB);
    printf("closed the device\n");
    for(i=0; i<4; i++)
    { if(chipaudio[i]) FreeMem(chipaudio[i],WAVES_TOTAL);
      if(replyPort[i]) DeletePort(replyPort[i]);
    }
    if(controlPort) DeletePort(controlPort);
    printf("%ls\n",string);
    exit(0);
return(0);
} /* end finishup */
int
ControlChannel(channel, command)
    WORD channel;
    WORD command;
{
    LONG rtn;
    struct ExtIOB *iob, controlIOB;
    iob = &controlIOB;
    iob->ioa_Request.io_Device     = device;
    iob->ioa_Request.io_Message.mn_ReplyPort =
                                       controlPort;
    InitBlock(iob,channel);
           /* init it for CMD_WRITE, then change */
    iob->ioa_Request.io_Command = command;
    iob->ioa_Request.io_Flags    = IOF_QUICK;
    BeginIO(iob);
    WaitIO(iob);
```

```
   rtn = ((LONG)(iob->ioa_Request.io_Error));
   return(rtn);
return(0);
} /* end ControlChannel */
struct ExtIOB *
GetIOB(ch)
   LONG ch;
{
   WORD i,use_reply;
   struct ExtIOB *iob;
        /* in case we need to allocate one */
   ReEmployIOB();
        /* find already used ones and free them */
        /* so that when we do a get... */
   if(ch == -1) use_reply = 0; /* reply port to use */
   else         use_reply = ch;
   for(i=0; i<AUDBUFFERS; i++)
   { if(inuse[i] == NO)
      { inuse[i] = YES;
audbuffer[i].ioa_Request.io_Device = device;
audbuffer[i].ioa_Request.io_Message.mn_ReplyPort =
                              replyPort[use_reply];
audbuffer[i].ioa_Request.io_Message.mn_Length = i;
audbuffer[i].ioa_Request.io_Message.mn_Node.ln_Name =
                                          globalname;
 #ifdef DEBUG
        printf("Using a global iob\n");
 #endif DEBUG
        return(&audbuffer[i]);
       }
     }
 /* if all globals are in use, have to allocate one */
   iob = (struct ExtIOB *)AllocMem(sizeof(
                          struct ExtIOB),MEMF_CLEAR);
   if(iob == 0) return(0);        /* out of memory */
   else
   {    iob->ioa_Request.io_Device = device;
        iob->ioa_Request.io_Message.mn_ReplyPort =
                                  replyPort[use_reply];
        iob->ioa_Request.io_Message.mn_Node.ln_Name =
                                          dynamicname;
        iob->ioa_Request.io_Message.mn_Length =
                                   dynamix[use_reply];
        dynamix[use_reply] += 1;
/* add 1 to number allocated for a specific channel*/
#ifdef DEBUG
        printf("Allocated a new dynamic iob\n");
#endif DEBUG
        return(iob);
   }
return(0);
} /* end GetIOB */
/* ReEmployIOB - look at all of the reply ports and if
any IOBs hanging around with nothing to do, free them. */
ReEmployIOB()
{
   LONG i;
   struct MsgPort *mp;
   struct ExtIOB *iob;
   for(i=0; i<4; i++)
        /* remove all iob's from all ports */
    {mp = replyPort[i];
     while( (iob = (struct ExtIOB *)GetMsg(mp)) != 0)
        {
#ifdef DEBUG
        printf("type of iob freed is: %ls\n",
        iob->ioa_Request.io_Message.mn_Node.ln_Name);
        printf("its identifier value is: %ld\n",
             iob->ioa_Request.io_Message.mn_Length);
#endif DEBUG
        FreeIOB(iob, i);
        }
    }
return(0);
} /* end ReEmployIOB */
/* Free a global or an allocated IOB */
int
```

```
FreeIOB(iob, ch)
   struct ExtIOB *iob;
   LONG ch;   /* which channel was it attached to? */
{
   WORD i;
   if(iob->ioa_Request.io_Message.mn_Node.ln_Name ==
                                          dynamicname)
   { FreeMem(iob, sizeof(struct ExtIOB));
     if(dynamix[ch]) dynamix[ch] -= 1;
                         /* subtract one if nonzero */
     return(0L);
   }
  else if(iob->ioa_Request.io_Message.mn_Node.ln_Name
                                          == globalname)
   { i = iob->ioa_Request.io_Message.mn_Length;
#ifdef DEBUG
    printf("Freeing global buffer numbered %ld\n",i);
#endif DEBUG
    if(i < AUDBUFFERS)
    {inuse[i] = NO;   /* frees this one for reuse */
    }
    return(0L);
    }
/* if get here, names don't match, something is wrong. */
   else {printf("FreeIOB: names don't match...
                                    unknown error\n");
   return(-1);/* unknown source of IOB fed to routine. */
   }
return(0);
} /* end FreeIOB */
/* Initialize an audio I/O block for
    default CMD_WRITE operation.    */
int
InitBlock(iob, channel)
   struct ExtIOB *iob;
   WORD channel;
{
/* Device and ReplyPort fields have been
                              initialized by GetIOB */
   iob->ioa_Request.io_Unit = unit[channel];
/* Allocation key */
   iob->ioa_AllocKey = key[channel];
/* Where's the waveform?
              ...Just be sure is in MEMF_CHIP!!! */
/* USER initializes datalength[ch] before calling
this; for sampled sound command write operation. */
   iob->ioa_Data   = chipaudio[channel];
   iob->ioa_Length  = datalength[channel];
/* Another routine, must initialize:
      period     ioa_Period
      volume     ioa_Volume
      cycles     ioa_Cycles
      message    ioa_WriteMessage    */
/* Default command type is CMD_WRITE */
   iob->ioa_Request.io_Command = CMD_WRITE;
/* If IOF_QUICK is zeroed, this would affect the
period and vol. If a CMD_WRITE, it queues if another
note is already playing. We queue CMD_WRITES.      */
   iob->ioa_Request.io_Flags = ADIOF_PERVOL;
   return(0);
} /* end InitBlock */
/* To request "any" channel, use ch = -1; To request
a specific channel, use ch = {0, 1, 2 or 3};       */
int
GetChannel(ch)
   LONG ch;
 {
    int error, value;
    struct ExtIOB *iob, controlIOB;
    iob = &controlIOB;
    iob->ioa_Request.io_Device    = device;
    iob->ioa_Request.io_Message.mn_ReplyPort =
                                         controlPort;
 InitBlock(iob,0);
            /* init it for CMD_WRITE, then change */
    iob->ioa_Request.io_Message.mn_Node.ln_Pri = 20;
    iob->ioa_Request.io_Command = ADCMD_ALLOCATE;
    if(ch == -1)
    {   iob->ioa_Data = (UBYTE *)anychan;
        iob->ioa_Length = 4;
    }
    else if(ch >=0 && ch <= 3)
    {   iob->ioa_Data = (UBYTE *)(&anychan[ch]);
        iob->ioa_Length = 1;
    }
    else
/* chose a bad channel number; cannot allocate it */
    {   return(-1);
    }
    iob->ioa_Request.io_Flags = ADIOF_NOWAIT | IOF_QUICK;
    BeginIO(iob);
    error = WaitIO(iob);/* returns nonzero if error */
    if(!(iob->ioa_Request.io_Flags & IOF_QUICK))
    {GetMsg(iob->ioa_Request.io_Message.mn_ReplyPort);
    }
    if(error)
    { return(-1);
    }
    gotunit   = (iob->ioa_Request.io_Unit);
    gotkey    = (iob->ioa_AllocKey);
    switch((LONG)(iob->ioa_Request.io_Unit))
    { case  1:  value = 0;  break;
      case  2:  value = 1;  break;
      case  4:  value = 2;  break;
      case  8:  value = 3;  break;
      default:  value = -1; break;
    }
    return(value);
return(0);
} /* end GetChannel */
int
FreeChannel(ch)
   LONG ch;
{
   int error;
   struct ExtIOB *iob, controlIOB;
   iob = &controlIOB;
   iob->ioa_Request.io_Device = device;
   iob->ioa_Request.io_Message.mn_ReplyPort =
                                      controlPort;
   InitBlock(iob,ch);
     /* init it for CMD_WRITE, then change      */
     /* (pick up unit and key value for channel) */
   iob->ioa_Request.io_Command = ADCMD_FREE;
   iob->ioa_Request.io_Flags =
                          ADIOF_NOWAIT | IOF_QUICK;
   BeginIO(iob);
  error = WaitIO(iob);
                     /* returns nonzero if error */
  if(!(iob->ioa_Request.io_Flags & IOF_QUICK))
  { GetMsg(iob->ioa_Request.io_Message.mn_ReplyPort);
  }
   if(error)
   { return(-1);
   }
   return(0);
} /* end FreeChannel) */
/* THE FOLLOWING ROUTINES ARE PARAPHRASED FROM A USENET
  and BIX POSTING MADE IN 1985 BY STEVEN A. BENNETT. */
/* I have modified his routines to queue the audio
 commands in place of starting forever-duration and
 canceling each note. Many of his original comments
 have been incorporated into the article.
*/
/* PlayNote(...) */
/* Starts a sound on the channel with specified
 period and volume. This nice little routine takes
 a note and plays it on the given voice.  The note
 is basically an integer from 0 to 11 (c to b) plus
 12 per octave above the first and lowest.
 * The waveform to use is determined by adding an
 index (woffsets[]) dependant on the octave.
 * The length of the waveform (in wlen[]) is
 likewise dependant on the octave.  Note that
```

```
 octaves start with zero, not one.
 */
 int
PlayNote(channel, note, wf, vol, duration,
                                  priority, message)
   char *wf;                   /* waveform to use */
   LONG vol, channel, duration, note;
                          /* specific note number */
   LONG priority;
   struct Message *message;
   {
   LONG per, len, oct;
     /* period, length of waveform, which octave */
   char *wavepointer;
                /* where to find start of waveform */
   struct ExtIOB *iob;
   int frequency;
   iob = GetIOB(channel);
   if(iob != 0)
   {
     InitBlock(iob, channel); /* set up for CMD_WRITE */
     oct = note / 12;
     wavepointer = wf + woffsets[oct];
     len = wlen[oct];
     per = perval[note % 12];
     /* Set the parameters */
     iob->ioa_Data = (UBYTE *)wavepointer;
     iob->ioa_Length = len;
     iob->ioa_Period = per;
     iob->ioa_Volume = vol;
/* Look at the frequency that it is to
                 play by backwards calc. */
     frequency = 3579545 / (len * per);
/* Calculate cycles from duration in 1000ths
 of a second. Multiply all-in-one to maintain max
 precision possible (all integer arithmetic.)   */
      iob->ioa_Cycles =
          ((LONG)(frequency * duration)/1000);
      BeginIO(iob);
      return(0);                /* all went ok */
   }
   else
   {  return(-1);           /* couldnt get IOB */
   }
return(0);
} /* end PlayNote */

/* SetPV(channel, per, vol)
 int channel, per, vol;   */
int
SetPV(channel, per, vol)
   int channel, per, vol;
   {
   int error;
   struct ExtIOB *iob, controlIOB;
   iob = &controlIOB;
   iob->ioa_Request.io_Device = device;
   iob->ioa_Request.io_Message.mn_ReplyPort =
                                  controlPort;
   InitBlock(iob, channel); /* set up for CMD_WRITE*/
   iob->ioa_Period = per;
   iob->ioa_Volume = vol;
   iob->ioa_Request.io_Command = ADCMD_PERVOL;
   iob->ioa_Request.io_Flags = IOF_QUICK | ADIOF_PERVOL;
   BeginIO(iob);
/* This one will be synchronous; affects whatever
 is playing on this channel at this time.        */
 error = WaitIO(iob);
               /* OK to wait, since it will return */
 return(error); /* copy of io_Error field; should be 0 */
return(0);
} /* end SetPV */

/* SetWaves(w1, w2, w3): create first sawtooth, triangle
and square wave */
SetWaves(w1, w2, w3)
   UBYTE *w1, *w2, *w3;
{
```

►

```
    int i, increment, value, sqvalue;
    value = 0; increment = 2;
    sqvalue = 127;
    for (i = 0; i < BIG_WAVE; ++i)
    {
        w1[i] = i;  /* do the sawtooth */
        if(i > 62 && i < 180) increment = -2;
        else
        if(i >= 180) increment = 2;
        w2[i] = value;  value += increment;
                        /* triangle wave */
        if(i > 126) sqvalue = -127;
        w3[i] = sqvalue;

    }
return(0);
} /* end SetWaves */

/* ExpandWave(wfp) - replicate waves in
 decreasing sample sizes...BYTE *wfp; */
ExpandWave(wfp)
    BYTE *wfp;
{
    int i, j, rate;
    BYTE *tptr;
    rate = 1;
    tptr = wfp + BIG_WAVE;
    for (i = 0; i < NBR_WAVES - 1; ++i)
        {
        rate *= 2;
        for (j = 0; j < BIG_WAVE; j += rate)
            *tptr++ = wfp[j];
        }
return(0);
} /* end ExpandWave */

/* MakeWaves()   Just makes a sawtooth, triangle
and square  wave in chip mem and expands them. */
int
MakeWaves()
{
/* allocate the memory for the waveforms. */
    w1 = (UBYTE *)AllocMem(WAVES_TOTAL, MEMF_CHIP);
    w2 = (UBYTE *)AllocMem(WAVES_TOTAL, MEMF_CHIP);
    w3 = (UBYTE *)AllocMem(WAVES_TOTAL, MEMF_CHIP);
    if (w1 == NULL || w2 == NULL || w3 == NULL)
        return(-1);       /* ran out of memory! */
    /* get and expand the waveforms     */
    SetWaves(w1, w2, w3);
    ExpandWave(w1);   chipaudio[0]=w1;
    ExpandWave(w2);   chipaudio[1]=w2;
    ExpandWave(w3);   chipaudio[2]=w3;
return(0);
} /* end MakeWaves */
/* END AUDIOTOOLS.C */
```

Listing 2. audiotools.h

```
/* audiotools.h */

#define StartChannel(c) ControlChannel(c, CMD_START)
#define StopChannel(c)  ControlChannel(c, CMD_STOP)
#define ResetChannel(c) ControlChannel(c, CMD_RESET)
#define FlushChannel(c) ControlChannel(c, CMD_FLUSH)
#define  BIG_WAVE          256L
          /* size of biggest waveform */
#define  NBR_WAVES         7L
          /* number of waves per instrument */
#define  WAVES_TOTAL       1024L
          /* alloc size for instrument's waves */
#define  DEFAULT_DURATION  500L
          /* 500/1000ths of a second default */
#define  AUDBUFFERS        20L
          /* iob msg packets before need to allot */
#define  YES               1L
#define  NO                0L
/* In a later release, ExtIOB will be defined exactly
 as IOAudio but with a few more items tacked on at
 the end. This minimizes changes to existing
 routines when we later extend the structure.      */
#define  ExtIOB    IOAudio

/* a few forward declarations */
extern struct ExtIOB *GetIOB();
extern int FreeIOB();
extern int GetChannel();
extern int GetStereoPair();
extern int InitBlock();
extern struct MsgPort *CreatePort();
```

Listing 3. globals.c

```
/* globals.c */
struct IOAudio openIOB;
                  /* IOB to open and close the device */
struct MsgPort *auReplyPort; /* temporary pointer */
struct MsgPort *controlPort;
                 /* Port for ControlChannel functions */
char *globalname  = "global";
                       /* the name for global IOB's  */
char *dynamicname = "dynamic";
                       /* the name for dynamic IOB's */
UBYTE stereostuff[4] = { 3, 5, 10, 12 };
                         /* channel masks for stereo */
UBYTE anychan[4] = { 1, 2, 4, 8 };
                           /* channel masks for mono */
/* Resolve all externals */
struct ExtIOB      audbuffer[AUDBUFFERS];
                 /* globals to build-in */
UBYTE                *chipaudio[4];
                 /* pointers to waveforms in CHIP RAM */
struct Unit          *unit[4];
                 /* global pointers to Units */
struct Device        *device;
                 /* global pointer to audio device */
LONG                 datalength[4];
                 /* length of the data for a wave */
struct MsgPort       *replyPort[4];
                 /* one ReplyPort per channel */
BYTE                 inuse[AUDBUFFERS];
                 /* keep track of globals in-use */
WORD                 key[4];
                 /* global value for alloc keys */
struct Unit          *gotunit;
                 /* returned unit value */
WORD                 gotkey;
                 /* returned allocation key */
LONG                 dynamix[4];
                 /* counters for how many dynamically
                   allocated audio message I/O blocks */
/* Each waveform buffer contains 8 octaves of the
wave. The offset values specify where in the buffer
the proper waveform table for that octave begins. */
int woffsets[]  = { 0, 256, 384, 448, 480,
                       496, 504, 508, 510 };
/* Length of each waveform within a buffer */
int wlen[]      = { 256, 128, 64, 32, 16, 8, 4, 2, 1 };
/* Period value to go with the notes in an octave. */
int perval[]    = { 428, 404, 381, 360, 339, 320,
                    302, 285, 269, 254, 240, 226, 214 };
UBYTE *w1, *w2, *w3;
BYTE *owptr[4] = { NULL, NULL, NULL, NULL };
extern struct   Message    *GetMsg;
extern aptr     AllocMem;
```

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